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## NEWS IN BRIEF

Unions fight  
ICL closure

UNIONS fighting the proposed closure of ICL's factory at Dukinfield (CW, November 29, 1979) with an expected loss of over 800 jobs, presented a report to the company this week outlining their alternative proposals and questioning the whole of ICL's corporate strategy.

ICL has confirmed that its 90-day redundancy notices to workers are now being in force after a 28-day suspension was granted before Christmas.

## Consultancy

A FORMER director of the financially ailing Gamma Associates, Bernie Green, who left late last year (CW, November 8) has set up his own consultancy in Nottingham, called B. D. Green & Co. It offers what it describes as impartial and unbiased advice in the application of computing.

## Motorway system

A NEW prototype motorway signalling system has been ordered by the Department of Transport from Grundy and Partners of Stonehouse, Glos. To be evaluated at the Almondsbury Control Centre, it uses 8x4 foot display panels overlying LED displays. These can be individually addressed for identification and control by a fibre-optic based light sensitive 'pen'.

## Council drops ICL

COVENTRY Corporation is switching from its eight-year-old ICL System 4 to an IBM 3031. The IBM system will be delivered later this year and will be chosen in preference to ICL's tender for a 1972.

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## COMPUTER WEEKLY

## Leasing loss forces Lloyd's to double deposit

THE total estimated \$340 million loss from computer leasing policies faced by syndicates at Lloyd's of London is one of the reasons why Lloyd's members are being instructed to increase from 25% to 50% the proportion of their "show of wealth" that they have to deposit to ensure that claims can be covered.

Each member's "show of wealth" is probably not his total personal wealth, but it

determines the overall value of all the risks he can take on. The total must be no more than twice his "show of wealth".

The \$340 million estimate is more than \$100 million greater than the first loss estimate made for Lloyd's year ago. The new estimate was calculated by the First National Bank of Boston, the organisation appointed by Lloyd's last year to administer the payment of the 15,000 or so individual

claims being made under the now famous "J" policies that cover the residual values of IBM mainframes on third party operating leases. Most of the lessors involved are based in the US.

Itel, which took out about a third of all the policies by value, alone expects to put in claims totalling \$200 million (CW, December 13, 1979), so the total claims on Lloyd's could be a lot higher than \$340 million.

Datapoint challenge  
for office of future

A COMBINED data processing and word processing system that communicates and also carries both data and voice on the same lines has been introduced by minicomputer maker Datapoint as its entry into the "Office of the Future" stakes.

Called the Integrated Electronic Office, Datapoint's system is a serious challenge to the other firms such as Xerox, Plessey, IBM and Nexos whose complete office systems are still only on the drawing board.

The new product is based on Datapoint's Attached Resource Computer system which provides a range of functions to individual model 1300 terminals on desks through a network connecting terminals, discs and so on. Available in the new system are message handling and

switching, filing, word processing, data processing, electronic mail and "mailbox", and automatic control of voice switching.

Store-and-forward voice is not yet available but is under development.

The Integrated Electronic Office is already being marketed in the US and is due to be launched by Datapoint's UK agents, Ventek, in February.

The electronic mail facility can send messages either to other terminals on the same site or to remote computers using the public switched network.

The Long Distance Control System, as it is called, dials the distant machine and sends the message, all automatically. Received messages wait in an "in basket" until the user wants

to read them. Voice calls are also controlled by this "Infowatch" equipment which can select least-cost routes automatically.

Word processing files are held on centralised hard discs that incorporate a Common File Processor.

A major significance of the product, in Datapoint's view, is that so many different functions are available on the same terminal. DP facilities include

Cobol, Basic, and RPG, and information retrieval software is also incorporated.

Both Plessey and Nexos are emphatic about the importance of voice in the complete office system, and Datapoint's head-start into the market with voice facilities, however rudimentary they be, must increase the problems of the other firms.

US interface battle  
hots up

THE battle against the US Commerce Department's proposed adoption of the IBM 360/370 channel interface as its input-output standard for all mainframes acquired by the US government continues.

The implementation of the standard has been put back to June 23 this year. In a joint action Honeywell, Burroughs, Control Data and Univac are seeking a court order to block the implementation.

The companies say that the standard is a retrograde step and that if they did not implement it they would be barred from competing for what is an estimated annual market of \$4,700 million.

The Commerce Department has denied this, saying that at least two of the four firms already have channel interface adapters which would enable their mainframes to meet the standard.

Principal objection to the standard is that the request acknowledge-byte transfer protocol of the IBM channel imposes an overhead which would effectively limit data

transfer rates to about 1.5 megabytes per second. This would mean that the government would be unable to take advantage of new technology which will be able to accept and deliver data much faster.

In a paper commenting on the possible effects of the standard, Advanced Computer Techniques of New York forecast that by imposing an unfair high cost and performance penalty on the non-IBM or plug-compatible suppliers in what is already a low profit market, imposition of the standard would tend to reduce competition and put up

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prices.

## Chip technology breakthrough

From front page

Josephson based circuitry in future machines, while ICL with its Distributed Array Processor simply said that it was "keeping a watching brief" on these new technologies.

ICL said that its own in-house device development was confined to silicon technology.

Univac has been working on GaAs device development for some time, although last year the company's former director of research and technical plan-

ning, Dr Barry Borgeson, told Computer Weekly that Univac might end up buying in GaAs devices from Rockwell (CW, May 31, 1979).

Fujitsu is also understood to have done considerable research on these devices.

Meanwhile, Rockwell itself sees ultra high speed data transmission as the first major application area for its GaAs devices, although the company envisages the announcement of its first GaAs products as being more than a year away.

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Forum for  
micro  
buyers

THE third of the Microsystems series of conferences and exhibitions is being held at the Wembley Conference Centre, London, from January 30 to February 1.

A new feature this year is a series of Buyers Forum sessions designed to help prospective purchasers to establish criteria for the effective selection of products.

Each session will be chaired by an independent speaker who will give an introductory talk, followed by four short presentations by suppliers.

The session will then be rounded off with a question-and-answer period in which the audience will participate.

Subjects for the sessions are microprocessor development systems, 16-bit microprocessors, memory systems, printers for microsystems, bus structures, and packages for PCs.

The chairman are drawn from the academic and consultancy worlds.

For details of Microsystems 80, including a conference programme and registration form, please write to Business & Industry Training, Room 874, Dorset House, Stamford Street, London SE1 9LU or telephone 01-261 8417.

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Briefing  
Systems for  
UK from Japan

A RANGE of small business systems from Japan has been introduced in the UK by the electronics giant Matsushita. The systems run a suite of business programs developed by CAP-PP using its Microcobol. There are four models, each with 64K of memory and built-in twin floppy discs. They cost between

£8,000 and £9,000. The machines will be sold under the Panasonic name through UK distributors. This is the first time the systems have been available outside Japan.

The researchers, from York University's education department, aim to gather together and explore the ideas that are coming out of schools and make them transferable to others.

General education rather than specialist is the concern of the study, and computer awareness will be a major part, although not all of it. Basic information, for instance, which micro-buy will be made available to schools, is a database of current projects in being.

One school is interested in linking computer awareness with other forms of study, such as "thinking" training as described by Edward de Bono. Elements of computer programming are being added to this. There will be a sixth-form college which is planning to add computer appreciation to its course on the broader issues of technology, involving decision-making on technological change, nuclear power and the like.

## Chairman quits

SIR Robert Clayton has resigned as chairman of new semiconductor company GEC-Fairchild, rival to the NEB's Immos, to remove the embarrassment of potential clash of interests following his appointment to the board of the National Enterprise Board.

## Jaime steps up

COMPUTER Weekly's chess-playing protégé, 12-year-old Jaime Gorman, will be one of 25 under-18s playing international grand master Larry Christiansen simultaneously this Saturday. The honour of playing was one of the prizes in the London Evening Standard Junior Tournament, in which Jaime came third out of 100 players in the under-14 group.

## Byte Shop bidders

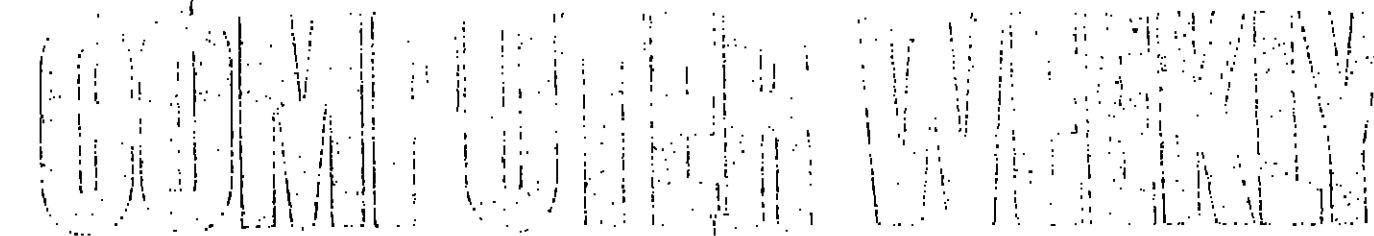
THERE are two leading contenders for the purchase of the troubled Byte Shop chain of six retail computer stores. One is Comart (CW January 10), and the other is understood to be Currys. Comart's existing dealers are watching the situation closely. Digitus summed up one view by saying, "Obviously it is a potentially compromising situation if Comart moves into retailing with the Byte Shops. But our sources of supply have been assured by Comart. They are a good company to work with."

## Nexos fax launch

NEXOS has launched its first product that is new to the UK market: a facsimile transceiver compatible with the CCITT standard for three-minute transmission of an A4 page, and an option to transmit it in less than one minute. With engineering support from facsimile specialists Muirhead, Nexos aims to secure a major slice of the European market. Full details, page five.

## 100m chips a month

THE £45 million being invested by National Semiconductor in its Greenock, Scotland, facility (CW, July 28, 1979) will make it one of the most productive in the world. It will be one of the first to use silicon wafers of five inches diameter, and should be able to produce about 100 million chips a month.



Number 689

Thursday, January 17, 1980

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## Where will the Oozlum go in the Eighties?

FUNDAMENTAL changes will hit the computing profession as soon as technological and commercial limits are reached, and those on the inside need to look at the ideas coming from the outside world to be able to adapt.

That was the view put forward by Iann Barron, managing director of Immos, in this year's British Computer Society annual lecture.

Peter Merrick Associates Ltd International Computer Services Century House 27-29 Old Road Croydon CR9 1LB

Barron entitled his talk The Oozlum Computer, from the bird that goes round in ever-decreasing circles. He pointed out that the falling costs of integrated circuits would soon start to level off and then rise as increasing complexity and manufacturing limitations took over from the economies of scale in ICs.

There was no point in increasing the number of devices on a chip indefinitely, he said, suggesting that 80% of the market now would be satisfied by presently available complexity.

Computing had been restrained for too long by the serial view of processing imposed by von Neumann's original design, Barron said, but the momentum on development was now outside the industry, among the millions of hobbyists and users' programmers who were interested solely in processing information, not in the technicalities of computing. These people needed languages geared to simultaneous processing, and to provide these we must re-orient the way we think about languages and not just bolt on new

features, as with Ada. Companies were mistakenly trying to preserve the capabilities they have by increasing power and complexity and are thus producing technologies that are not at all suitable for these real applications, Barron insisted. He gave as examples, the bipolar and Josephson Junction work that IBM is doing. Instead, Barron said, we need to re-evaluate a lot of our ideas about computing to establish which are fundamental and what ideas from outside are going to affect our patch.

"Our skills are transient," Barron said, suggesting that the BCS look to the future so that we could adapt rapidly to the changes soon to come.

ICL is fully committed to the large systems business and its VME operating systems are here to stay. A statement on Monday from communications director Alan Benjamin in response to Computer Weekly (CW, January 10) should quell the rumours that have surrounded ICL's plans. And it suggests that ICL

is planning a "super 2900" offering five times the power of the 2982, currently its top machine, with a launch pencilled in for 1984.

"In response to your editorial," Benjamin told Computer Weekly, "we welcome the opportunity to make a clear statement about our large system plans."

"It is now, and will be for the foreseeable future, a manufacturer of large computers. In the past year, we opened two new plants in the Manchester area, one for the assembly and test of large systems and the other for ICL's own manufacture of multi-layer boards for use in large systems. The substantial capital investment we made in these plants reflects our intentions clearly."

On the VME operating systems, ICL was equally unequivocal. "We are dedicated to the continued development of VME/B and VME/K, which are both close to their maturity thresholds and will provide excellent and relevant facilities for our customers," said Benjamin.

"We hope your readers will consider the speculation about large systems and our operating systems as dead."

ICL says its large systems business is broadly as profitable as its business as a whole. The company's future plans include a new SL (L for LSI) series to follow the current and future S models in the 2900 line.

A machine code-named S4L, targeted for launch in late 1984, is understood to have a target power about five times that of the 2982.

Turn to back page

INSIDE THIS WEEK'S CW....

MICRO-SYSTEMS  
With a new decade just starting, it is only right that new technology in the shape of microprocessors and microsystems should be the subject of the industry's first major annual event. Microsystems 80 opens at the end of this month at the Wembley Conference Centre, and this week we give a preview of what can be seen and heard there.

ALSO...  
Computer interview on sales to Russia  
Letters to the Editor  
UK legs behind  
Downton by Chad Glibb's Mythology  
Focus on belt-tightening  
Nexos in last market  
Pete Glibb's programme  
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How to get started  
with microprocessors

BRITAIN's leading professional microprocessor exhibition and conference, Microsystems 80, is being held at the Wembley Conference Centre from January 30 to February 1. For those who want to know about microcomputers and software but don't know where to start, this event could provide the answer.

For the first time Microsystems will feature three one-day professional development courses designed to introduce the beginner to various aspects of the micro world.

The course on January 30, "How to get started with microprocessors", is designed as an introduction for managers who must make crucial decisions

affecting the development, manufacturing and marketing of products incorporating microprocessors.

A hands-on workshop for engineers entitled "Microprocessors/Microcomputers" is being held on January 31. This will give participants a practical insight into the basic concepts of microprocessors.

At a slightly more advanced level the course on February 1 is "Pascal: the language of microsystems".

For further information about Microsystems 80 write to Chris Higwell Room 125, Dorset House, Stamford Street, London SE1 9LU or telephone 01 261 8894.

Seicon buys Scan bureau

GSI UK, formerly the CRC Group, has decided to sell its online financial services bureau, Scan, to Seicon Computer Services of Milton Keynes.

Seicon is said to be a suitable buyer for Scan. Scan's services for stockbrokers like portfolio management and investment

research complement Seicon's existing financial services.

Seicon, which operates a Univac 1100/81 at Milton Keynes, is a much bigger Univac user than GSI and therefore is in a better position to tackle the rewriting of the Scan software to run on 1100 series machines.

The Intertel range of data communications equipment was the first to be based on the same principles as the systems it's designed to support. In other words a true systems approach from modems to powerful network controllers.

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## Downtime

by Chad

## Beware quarks!

I WAS doing a little light reading the other day, browsing through IBM Research Highlights, when I came across a headline "Quarks may have triggered Big Bang."

This is to do with a sideline of IBM's, you realise the Big Bang is not some spectacular system crash but the creation of the universe, and quarks — well, quarks are a bit like leprechauns. They are very small, and no one has ever seen one, but we are assured on good authority that they exist.

Apparently there are billions at Yorktown Heights who, when they have a moment while bawling away at new contraptions for doing people's sums for them, are exploring the mysteries of the cosmos. "Quarks may have triggered Big Bang" is their latest theory.

You have to admire the style of the thing: they take the smallest-scale, most impenetrable, finger-in-the-wind theorising there is and combine it with the largest scale, equally impenetrable speculation and produce a grand unified hypothesis "Quarks may have triggered Big Bang."

And indeed they may! On the other hand, maybe they didn't. We will never know, will we, unless we find someone who was there and remembers? His

index-linked pension will be pretty high by now.

It is always nice doing research that has absolutely no relevance to real life — then you can't be blamed for the ravages that technology wreaks on us.

All this triggering, the IBM men tell us, took place within one ten-thousandth of a second after the start of the universe. But what was going on before then? We ask. Ah, meaningless question! comes the reply. By definition the universe is everything, and so there isn't anything outside it or before it. Hmhmhm.

I believe that the answer is yes, and that this is precisely what Design by Objectives attempts to do. The assignment of objectives is explored in about 300 pages in my Software Metrics book, and I have recently completed a similarly extensive manuscript on Design by Objectives, which would begin to answer the "levels in a structured design" part of the question.

But I know that a lot of people are interested in better system architecture methods. So let me try to answer the question within my space constraints.

1. I believe, based on experience of doing it for ten years, that all critical system objectives can be stated in quantified and measurable form. This is, of course, fundamental to control of the design process.

2. To accomplish this, it is often necessary to explode high level goals (such as security) into several lower level goals (such as "probability of security cleared employees gaining access to data for which they are not cleared").

3. It will also be necessary to accept less-than-perfect measuring methods. The accuracy and reliability need only be sufficient initially to improve the predictable ability we have presently to meet our system objectives.

4. I believe that one important component of this strategy is the conscious use of an evolutionary design and delivery method. That is again based on years of experience in practising what I am preaching here, that we must spread the bulk of the design and analysis and planning throughout the project. This must be interspersed with partial incremental system delivery to the real end user. Partial delivery gives feedback, a more realistic form of analysis, from reality. This feedback must be used to tune the overall system design strategy and planning to a more realistic level.

5. Design specification can be top down, not only in functional specification as is commonly practised today, but also in specification of all objectives, and in the specification of design components in logicware, dataware, hardware and peopleware. "Functions" needs to be explained here. I use the term for those absolute user requirements over which the designer has no control. I use the term (design) "components" for those decisions which are the options of the designer, and which are specified in order to allow the system implementation to meet the stated objectives. This might seem a bit formal if you are not used to thinking in these terms. But I find it a quite useful and necessary way of thinking about, and specifying design. So if you are looking for something better, please consider the division of specification concepts into functions (user-required content), objectives (user-required attributes) and design components (designer specified means for getting the attributes).

6. "Must we rely on common sense?" No. I believe that Design by Objectives contains a teachable, repeatable and automatable route for specifying system designs.

Using a database of Technique/Attribute tables stored on a computer, we should be able to feed in a set of system objectives, and get at least a short-list of design suggestions. I fear that for many years to come we will require a lot of common sense in this process. But I do believe that we can

become far more systematic than we are at present.

My own Apple II is scheduled to be used as an expert prototype for this automated design method. I certainly would be interested in sharing these ideas in more detail with any reader who is prepared to put in a substantial amount of work to develop a research or commercial product which would be a designer's tool.

One component of the method is the Technique/Attribute Handbook consisting of tables, for example a table of costs and maintenance effects, a set of alternative machine technologies might be one.

The attributes specified: T/A tables must be compared to the objectives (which are also called "attributes") of our project system design. A major part of the design process is looking for one or more table entries which will provide a set of attributes required by a system or sub-system of objectives.

## GILB'S MYTHODOLOGY

## We can formalise system design in a structured way



Tom Gilb is an independent consultant, lecturer and author on computing topics.

A READER, Lyn Ansell of the Polytechnic of the South Bank, London, reacting positively to the several columns on Design by Objectives methods, still asks "How to assign objectives and controls to particular levels in a structured design? Must we rely on common sense or can we design a control methodology analogous to a structured programming methodology?" (Letters, October 2, 1979).

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The French PTT plans to stimulate the production of low cost digital transceivers by placing an order for 500,000 with one of four domestic manufacturers which are currently each building 50 prototypes for evaluation.

This contrasts with the situation a few years ago when manufacturers deliberately made their machines incompatible with those of their competitors and PTT's discouraged the attachment of strange machines to their jealously guarded voice networks.

The new aim is to create conditions under which fax users can contact each other directly in the same way as telex and telephone users.

The Nexos 6400 is imported from Oki, the Japanese computer peripherals manufacturer, to be sold in Europe under a licence agreement concluded jointly with Muirhead last summer, shortly before the link between Nexos and Muirhead was publicly announced.

Although CCITT is expected to ratify in April a Group 3 recommendation for transmitting an A4 page in less than one minute digitally, a steady market is forecast for Group 2 devices for several years.

Nexos intends to keep up with the most advanced technology compatible with a large market and, recognising the power that the French initiative will give to

## Nexos poised to scoop the fax market

NEXOS, the NEB-backed office systems company, is poised to take advantage of the expected dramatic expansion in the international market for facsimile transceivers. Its salesforce of 60 is now offering ex-stock a £3,000 facsimile transceiver which at its fast option rate of around 30 seconds for an A4 page is claimed to be the fastest analogue facsimile transceiver available.

The transceiver, called the Nexos 6400, also operates to the international communications body, CCITT. Group 2 recommendations for transmission of an A4 page in three minutes, and it is the existence of this standard that is expected to foster the growth of the market, along with the change of attitude of the international telecommunications authorities.

Nexos estimates that machines conforming to the six-

minute Group 1 recommendation now account for 85 per cent of the worldwide installed base of 400,000 transceivers.

Future developments in the market include the Post Office's international transmission between special offices, and plans to order subscriber devices in substantial quantities after consultation with the unions.

The German and Swedish PTTs are each ordering about 2,000 Group 2 devices from the Nippon Electric Company in Japan. The Danish PTT has plans for a subscriber service to follow trials of its Postfax service for which 20 transceivers have been installed in 10 Post Offices.

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software house, Amiba Software of Maidenhead, Bucks, is likely to be "the salvation of Series 1". EDX has certainly proved far less of a problem than the much more sophisticated RPS operating system.

Theorem normally picks up its Series 1 business from prospective Series 1 purchasers that IBM's General Systems Division has provided with the names of three software houses that could possibly handle the customer's application software development.

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## BBC speeds up its scripts

TO overcome the problems associated with moving about 30 million scripts of all types around Bush House departments, BBC External Services has installed an electronic distribution system. Broadcasters, journalists and translators in the 38 different language sections at Bush House, who previously had to wait up to two hours for a duplicate of a script while it was copied and delivered by hand, now use VDUs and printers to locate and copy items they require. Either the list of talks, features or news stories can be checked or only stories relevant to a particular inquiry.

Designed to cope with a 24-hour flow of information, the BBC system stores news scripts for seven days, current affairs for 14 days and more general features for 100 days.

The system features two General Automation 16/440 minis 137 VDUs and 121 printers located around Bush House. Project development was carried out by the Data System Division of IIT Business Systems.

## IS THERE A MICRO GAP IN YOUR PLANS?

## Fit in a visit to Microsystems 80

If you're thinking about microcomputers, why not come and see a range of Digital's LSI-11 based family of microsystems? We'll be at Microsystems 80 showing a working demonstration of an LSI-11/23 16-bit microcomputer with a TUS8 cartridge tape drive and world beating VT100 video terminal.

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Available in London, Reading, and Manchester. Details from Rosemary Gray, Reading (0734) 633556.

## Microcomputers from Digital Equipment Fit them into your plans.

digital

## Crystal gazing

IF you have a computer, better watch out next month! Old Moore's Almanack, that unimpeachable authority on the future (Robin Webster, our Futureview correspondent, please note) says about February "Strikes amongst public employees and hospital workers are particularly likely with attacks on computers and plans for mechanisation."

Old Moore is especially interested in computers this year. He confidently predicts that throughout 1980 "A general need for greater efficiency and increased competition will accelerate the move towards computer technology and automation. This is likely to produce a boom in orders for

automated machine tools, and an increased demand for skilled labour."

I would like to add a couple of predictions of my own to this. I know I am going out on a limb but I am prepared to take my reputation boldly in both hands and forecast: Prices will rise and the population of the world will increase.

So get ready to board up your windows and arm your operators to fend off the Luddites, who will be bearing down on you equipped with pencils and abacuses ready to smash your computers. After all, Old Moore never errs.

For March, he predicts "There is risk of closure of hospitals through sickness."

## Croxley business forms listing papers business systems Holdfast computer labels by John Dickinson

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## 10 years ago

From Computer Weekly of January 15, 1970...

AMONG the first companies to order IBM's new System 3 was the Colston group, makers of dish-washing machines. Two new machines launched in the UK were the Argus 800 from Ferndale, at £1,700 claimed to be the cheapest digital computer available in this country, and from Digital Equipment Corp. PDP-11, at £3,600 and above.

A major computer system was being designed for Marks & Spencer by International Computing Services Ltd.

Should the economy axe fall, not all is necessarily lost. According to Eddie Reynolds of Ford Europe, a speaker at last month's Online conference on IBM hardware, most mature installations could promote a self-funding DP productivity saving of between 15-20% per annum. Such savings could be achieved from re-negotiating equipment leasing and finance, where beneficial contracts are currently available.

Full-scale technical appraisals should generate savings of up to 20%.



# An unconventional approach to Basic language teaching

WITH small computers and languages such as Basic, there is an increasing number of people who are capable of programming but who are not professional programmers, and to whom the ability to program is only secondary to their main occupation.

As micros become a part of everyday life, the demands for teaching programming languages to the non-professional are on the increase.

For these reasons Richard Mayer, of the University of California, chose Basic in an article which examines the psychology of learning a programming language. His paper addresses the questions: What does a person know when he has acquired the knowledge to write simple Basic programs and how should a teacher effectively instruct a person so that he will acquire this knowledge?

As with most Americans, Mayer dwells laboriously on the psychological causes and effects of grasping a few basic concepts which English people seem to master without any apparent mental traumas. However, he does raise some interesting points about how a tutor should go about teaching a language like Basic to a programming novice.

What his piece boils down to is that people need to acquire three basic skills to learn Basic. These are: To analyse a statement into more specific statements or "pre-statements", to enumerate the transactions involved for each pre-statement, and the ability to group pre-statements into configurations.

This approach, says Mayer, emphasises the psychological concepts that underlie the relationship between program and output. The traditional method of teaching Basic, he says, does not do this.

"The traditional method of instruction," says Mayer, "is to help the learner see the relation between a list of statements, in a program, and a certain output. Generally, statements are defined and examples are given; the learner is encouraged to en-

gage in 'hands on' experience such as typing in programs and seeing what output comes out."

Mayer's approach, which he calls the "translational approach", emphasises the appreciation of statements and their meanings before it emphasises the "hands on" part of the training. Anyone who has undergone the conventional training so despised by Mayer will not doubt be slightly confused by this, but his interpretation of the learning process dwells more on an understanding of the logic involved in programming rather than the actual writing of the program.

The argument is backed up by considerable evidence in the

form of experiments with college students who had no prior experience of programming. They were taught a simplified version of Basic, but half the learners were taught using a concrete model of the computer and each statement was explained to them as a transaction within the model. The other half received the same instruction but the emphasis was on grammatical rules. As a result, the "model" group performed much better than the "rule" group on problems requiring creative programming but not on easy problems.

So what does all this go to prove? Nothing, you might say, or perhaps nothing that we

didn't know already. But from the evidence we have in this country, however intensive, the approach to teaching programming languages is invariably the same and includes a description of a computer and then hurries on to the absorption of a list of grammatical rules. Even where practical work with the computer is included in the curriculum, rarely does a course demonstrate the translation of statements into changes within the machine.

On the other hand, there are those in our midst who are perfectly capable of grasping the concepts of programming amazingly quickly, for example 17-year-old Adam Laurie who

was featured on this page some weeks ago and actually abandoned an NCC course to teach himself Basic.

So how important is the psychology behind teaching programming languages? The most important deduction that can be made from Mayer's article is that there will soon be people who will need and want to learn languages such as Basic quickly and for purposes peripheral to their major concerns. For these people Mayer's suggestions are not only useful but are becoming more and more relevant.

\* A Psychology of Learning Basic. R. E. Mayer. Published in Communications of the ACM. Volume 22, No. 11.

by Judith Morris

## Big changes on the way for Cobol programmer

THERE is little doubt the advance of technology will bring radical change in the world of that mythical person, the typical Cobol programmer, today.

The subject came up at a presentation, where the view was put that there will be a growth in the use of automatic software generators. At the same time there will be a generation of school-leavers, whom writing, say, a program, Basic is about on a par with solving a quadratic equation.

"With the falling cost of hardware, the use of software generators must become a norm," was one comment. "Today's programming methods are like cutting the lawn with a pair of scissors. The pressure on software houses to produce custom software quickly, they need a more efficient way of writing yet another pair of accounting suite or hardware falls, every school is able to afford its own Apple and they will be standard equipment."

"Professional programmers and analysts will increase; have to move up-market writing system software compilers and so forth."

Among the benefits of the tools is the ability to write portable modules at different times which can mesh together as a single program. In addition, standardisation and the use of automatic documentation generators is possible to write software which can be understood by the people who have to extend and modify it in the future — even if they have never seen it before.

The fact remains that many of the everyday jobs filled today by programmers will begin to disappear, and people should start to think now about where they want their career to go. Some obvious choices are to acquire the additional skills required for really complex programming tasks, or to learn enough about the business of the employer that they can apply that knowledge in other capacities within the company.

These automatic software generators and similar productivity tools do not exist. Why are they not widely used? Page Six will like to hear your views.

## Strong carrying the weak?

THAT programmers are a valuable and scarce breed is not a surprising statement. That many of them are incompetent, however, is a disturbing accusation.

According to several people in the industry there is a strong element of the strong carrying the weak within programming, and for every able programmer there are several others who are propped up by an enormous amount of aids and crutches.

Ben McQuaker, managing director of Master Resources, expressed his concern during an informal speech after presenting the first prize in our MRL/CV/Crossword competition.

He quoted a story that was told to a one-time customer of his in 1983. The company had 50 "good" programmers and 200 "poor" programmers, and the 50 were used to create and maintain a special high level language for the 200 to write applications. A similar company in South Africa was running an identical range of applications using a maximum of eight programmers.

McQuaker was concerned that all these aids did not, as they are intended, raise productivity. Are systems now implemented with less effort and on shorter timescales than before?

Machine efficiency has definitely been sacrificed in pursuit of these goals; but as hardware

costs have fallen this does not seem to matter too much.

McQuaker is convinced that so-called aids are often more of a hindrance to the programmer, as well as overheads in the machine.

"The biggest obstacle is in finding out what they do and the bizarre conventions needed to make them work," he explained. "They become a long time ago specialisations within specialisations. This trend was given a major boost in the early '80s. One large manufacturer discovered not for the first or the last time that the competition was technically way ahead of him, and that he had better try to introduce multiprogramming in a hurry."

"The software didn't work very well, so installations built up their own teams of experts to understand and sort out the supplier's software. Thus the user-based systems programmer was conceived. Many tasks could be programmed from scratch quicker than a utility could be set up, never mind learnt."

Consequently devices known as aids often turn out to be quite the reverse. "They impose a formidable series of learning requirements, a mountain of incomprehensible manuals and an immense amount of code to be corrected. No-one ever seems to have measured the net gain, unless it be to the suppliers who,

after all, provide all of this at a price which includes a profit margin."

Languages such as Basic and the availability of small computers such as the Commodore Pet make one realise that perhaps things are taking a turn for the better and programming will no longer be such an intricate and unnecessarily complicated task.

If it is allowed to happen.

McQuaker's reflections on the developments of programming are food for thought. But how do all these incompetent programmers feel about their value? And in particular what are their opinions, if any, on the so-called aids which are supposedly supporting them? Page Six, as usual, will be glad to hear their ideas.

## 'Why does no one want to give me a job?' asks Chris

AS we seem to have written this week mainly about programming languages, it was a change to receive a letter from a would-be programmer who has no intention of learning any of them.

Chris Blackmore, of Ilminster in Somerset, writes, "I am a Nascom owner. I have just written a Pilot Interpreter which runs on any of the available monitors. Perhaps you can explain why no one wants to give me a job as a computer programmer."

Unfortunately I can't explain, except to proffer the perhaps feeble argument that experience is always necessary and most employers now insist on mandatory years in the business before even considering a prospective programmer.

But Chris goes on to say, "Don't tell me I need two years' experience of Cobol. It is an appallingly bad language. So is Pilot. And Basic."

"I program best in machine

code," he continues, "and nobody wants to know. I think they can see it is better in terms of efficiency and ease of use. There's a closed shop being run by programmers or owners of huge machines. They are terrified of me and my friends, but we are here to stay."

An ominous threat, but one which will probably be ignored by most, not because they are dismissive about machine code, but more likely because they are unaware that people like Chris Blackmore do exist. Even if they are aware, they would find it very difficult to slot such a person into the conventional programming team which is behind most installations.

Is there anyone out there who has actually made it in machine code?

## Puzzler

I HAVE just received a most unusual Christmas card from friends in the US. It reads:

"Dear Puzzler,

D & J  
ANDRE  
SEND  
+  
CHEER

... and would like you to know that E=H.  
Most ingenious — and quite unique in my vast collection of alphametics. All 10 digits are represented, with nought being very easy to find of course.  
See page 63 for solution.

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## SOFTWARE FILE

# Elegant entry into JCL market

THE JCL management market has been entered by Computer Associates with its systems software package CA-Driver.

The product is intended to solve problems associated with the proliferation of JCL in expanding DOS/VS and DOS/VSE installations for which Computer Associates presents it as "an elegant alternative to OS".

The package aims to improve job scheduling and execution and, according to Computer Associates, goes further than OS in providing security, control and flexibility.

Computer Associates also claims that Driver "contributes to more efficient use of hardware resources, increased throughput and improved programmer/operator productivity".

The product is as yet unchanged in the field of providing

DOS users with facilities comparable to those available under OS. IBM's own Interactive Computing and Control Facility offers job management but its range is limited, and Computer Associates has been quick to fill the gap with its own answer to DOS job control problems.

Dave Torg, Computer Associates' vice-president of marketing, said that Driver had already met with an enthusiastic response from users in the US, where it was released over two months ago. It has a dozen customers there already and its recent European trials look promising.

A Computer Associates spokesman in Europe predicted a wide market for the product. "After the initial happy response to IBM's announcements on software policy, customer are

coming down to earth. There are 6,000 disappointed customers where VSE is concerned."

CA-Driver provides procedures from a disc-based central JCL repository with storage, maintenance and retrieval facilities. The operator can tailor procedures at execution time using features such as procedure expansion, symbolic parameter substitution and condition job step execution. It is available in the UK at an introductory price of about £4,580.

## ICL sale saved by APL language facilities

THE partnership of BOC Datasolve and ICL Dataskil to develop and sell APL language facilities on the ICL 2900 has borne results with a sale to the South African Multiple Life Assurance Society.

## Extended time sharing service

IN response to requests from clients, the scope of the APL time sharing service offered by I. P. Sharp has been extended. An APL system identical to that which I. P. Sharp itself uses is being offered as an in-house product for corporations with a dedicated IBM-compatible processor. It is now available under DOS/VS as well as MVT, MVS and VM.

Another option on the package is a worldwide communications facility using Sharp's own network. The package is offered at £48,000 with installation, training, conversion and support included in the price.

## Gresham enters fight for online systems for 2900s

ENTERING the fight to provide ICL 2900 users with online software systems is the Southampton firm Gresham Computer Services. Gresham has just announced VECOMS TP 2900, a system said to provide a total online environment for the implementation of transaction processing systems on the large 2900 range.

The system runs under VME/B and uses the standard ICL TP option, streamlining and building on ICL's own software. The firm has been working on it for the last three years, aiming

to fill what it saw as a gap in ICL services.

Gresham emphasises the comprehensive control offered by VECOMS as an advantage over Teletyping's TPS. The system is of a modular design including monitoring, performance and security facilities and applications routines as well as other ancillary software products.

VECOMS TP 2900 costs £18,000 and Gresham says that it has already aroused considerable interest.

## Cincom enhances T-task

THE online interactive query facility T-task, developed by Cincom Systems for use with its database management system Total, has been enhanced to include task level recovery, CTAM support and other features which Cincom says will improve the overall performance and efficiency of the product.

Having canvassed the product's 70 or so users, Cincom introduced improvements requested in Release 8.1 of T-task. According to Terry Booth, general manager of Cincom's systems software division, the performance improvements "enable the user to initiate more complex queries by increasing the amount of information that can be stored in Total files."

by Claire Gooding

## Standard for M-series?

THE Australian developed job control system JOL has won a contract from the Australian Bureau of Statistics to supply the language for its new Facom-based DP installation.

Facom's parent company, Fujitsu, is negotiating with JOL's originator, Clarke Computer Software, to make JOL the standard control language on all its future M-series mainframes. JOL aims to replace the complex IBM JCL, giving users of OS systems a powerful management facility and programmer language (Software File, November 15, 1979).

CSL has decided to develop the product further to make it available to DOS users.

## Dataskil to market general inquiry pack

A GENERAL inquiry system for the ICL 2900 series which was developed for in-house use by a large stockbroker firm, is to be adopted for marketing by ICL Dataskil.

The product, called Genie, is a procedure-driven inquiry and data manipulation language for use with the IDMS database. It is said to be fully interactive and designed to be used with equal ease by staff of all levels.

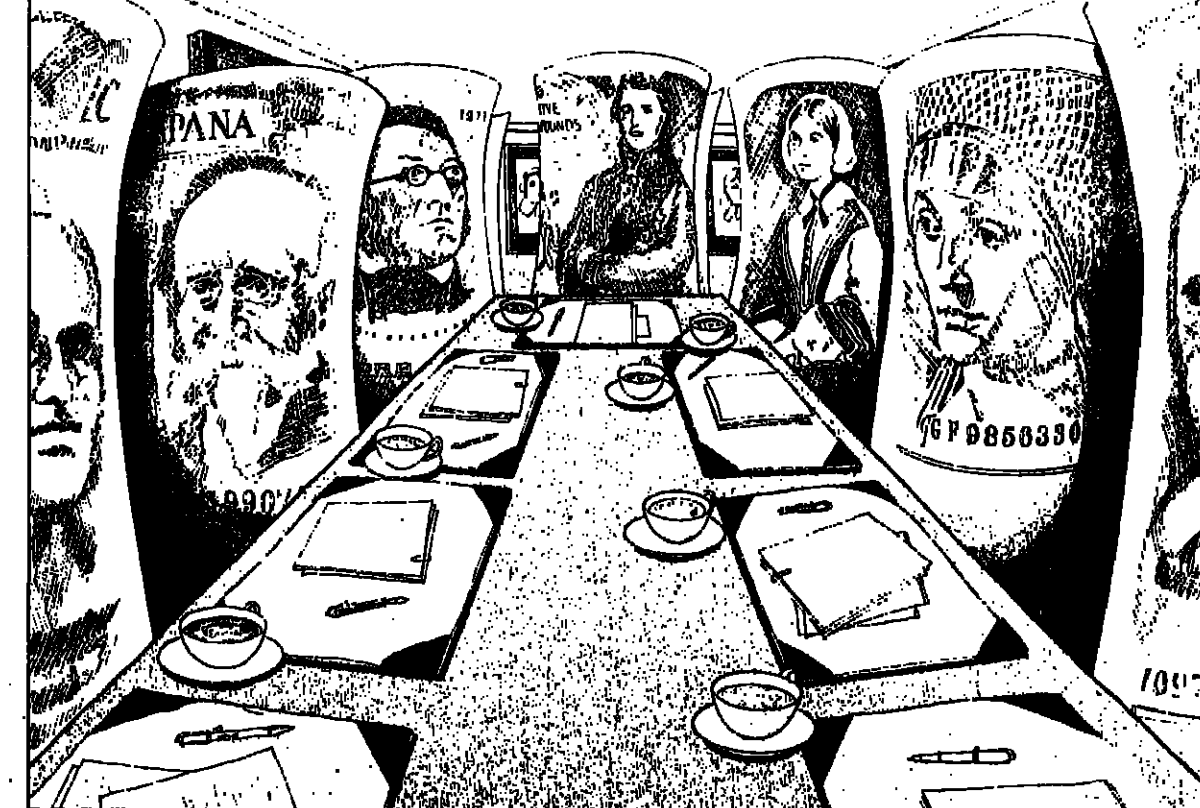
The firm, Mullens & Co, is the government broker as well as having business in the equity market. The need for fast, easy and accurate access to large

volumes of market-associated data which is often transient, has given rise to Mullens' expertise in inquiry and data manipulation systems. But this is the first time that a system for its own use has been designed with other users' needs in mind.

## IBM price rises

PRICE rises recently announced by IBM affect software products by 10%. At the moment the rises affect only Canada and the US, but UK users will derive little comfort from IBM's cautious statement that it "can't comment on the UK yet".

## "And now, I move a vote of thanks to Dataskil"



If your money's being wasted — by unrealistic stock levels, for example, or inadequacies in production, or wrong forecasts — you often don't know until you see the profit and loss account.

By which time it's a bit late. And if you have to choose between a set of financial options, how can you be sure you've taken account of every implication, without trying them out in practice?

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TU58



## OP SPOT

## Job control section can ease pressure

THE job control section has a vital part to play in the day-to-day running of the installation.

By performing such off-line functions as scheduling and job assembly and dealing with user inquiries, it takes pressure off staff in the computer room, enabling them to get on with their main task of optimising throughput.

At some installations the section is staffed on a full-time basis, often from 9 to 5 — while at others the operators move between on-line and off-line areas on a rota basis.

The section made up of job control specialists offers a high level of expertise, but does have certain drawbacks.

It is advantageous in that each member is able to concentrate on certain applications and can

therefore establish a rapport with "his" users.

This makes it much easier for the job controller to deal with a user who, for one reason or another, is dissatisfied with the service provided by the operations manager and shift leader, in that order.

The shift leader would retaliate by instructing his operators not to resubmit work that had failed because of errors on job control's behalf.

All a bit childish, really. As I see it, the best method is to have one or two job controllers and employ operators in the area on a part-time, rota basis.

That way the operators and job control staff are much less likely to be at loggerheads with each other over errors or respective shortcomings.

For their part, the operators get a better all-round knowledge of the operations function and that can only be to the benefit of the department.

If a job were more than a few minutes late on turnaround the job controller would complain to the operations manager and shift leader, in that order.

The shift leader would retaliate by instructing his operators not to resubmit work that had failed because of errors on job control's behalf.

All a bit childish, really. As I see it, the best method is to have one or two job controllers and employ operators in the area on a part-time, rota basis.

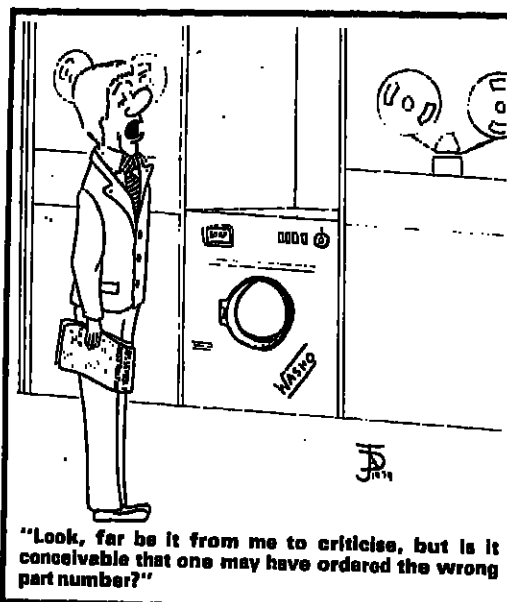
That way the operators and job control staff are much less likely to be at loggerheads with each other over errors or respective shortcomings.

For their part, the operators get a better all-round knowledge of the operations function and that can only be to the benefit of the department.

Arguments and bickering between the head of job control and the duty shift leader were an almost daily occurrence. And when the operations manager got involved he only succeeded in making matters worse.

by Bernard Allen

## Best spectacles for the operator with poor sight



"Look, far be it from me to criticise, but is it conceivable that one may have ordered the wrong part number?"

THE operator with poor sight faces a problem because conventional glasses — those intended for reading or long distance use — often prove an inadequate aid for viewing VDUs.

Bi-focals — glasses for reading and long distance use — are similarly ineffective as VDUs are most frequently viewed from an intermediate, or arms-length distance.

One solution is to have a separate pair for each task. But that is not practical as the operator must also read paper documentation (a short distance task) and watch what is going on in other parts of the computer room (long distance).

For reasons such as these the Optical Information Council advises operators to consider certain other glasses.

In a paper called Visual Display Units: Their Effects on the Eye, it points to the so-called tri-focal lens which, as the name implies, has three focal areas for short, intermediate and long distance.

Better still is the varifocal lens which caters for all ranges between the short and long distance. These are also cosmetically better than tri-focals as there are no apparent divisions between the focal areas.

The paper advocates all-out spectacle rims for the high powered lens but adds that they should be as slender as possible so as not to interfere with sideways vision.

The Optical Information Council is at Walter House, 422 The Strand, London WC2P 0PB.

## Jobs wanted for five TOPS students

A TOPS operations course recently finished at Borehamwood College, Herts, and five of the students are now seeking permanent positions in the industry.

All would prefer jobs in or near their home towns, but some are willing to re-locate, according to Derek Pinnock, operations lecturer at the College.

The students hail from Maidstone, Southampton and Luton, and another two, a married couple, are living in the Milton Keynes area.

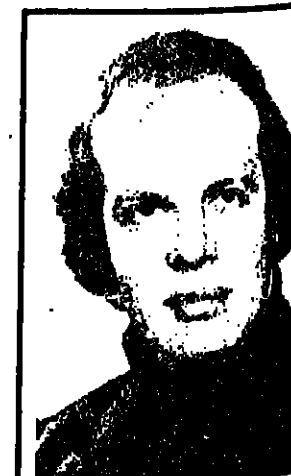
Pinnock told me, "The boy from Southampton has had no luck in that area, so he's prepared to move to London or the Home Counties to get work."

"The one from Maidstone in Kent has had no luck, either and his second choice is South London. I think he's got relatives in that area."

The next TOPS operations course at Borehamwood College starts in April.

## Wrong date

TWO weeks ago I mentioned the newly formed NCR 8200 Series User Group's next meeting in London. It gave an incorrect date. It takes place on January 24 and the venue is Credit Control Insurance, 120 Regent Street, London. It starts at 7.00 pm.



Home from Hong Kong

JOHN PENWARDEN, the 46-year-old senior operator featured in this column towards the end of last year, has just returned from his latest overseas assignment. He spent seven weeks in an operator training and support role at the Hong Kong Telephone Company, in Hong Kong.

## Anthology of Presentations

THE George 2 user group has been inundated with requests for copies of its Anthology of Presentations, a collection of lectures and hints given at group meetings over the past few years.

But the group has sold out. And I have been asked to extend patience from those awaiting copies. More are being printed.

The George 2 user group Anthology of Presentations costs £1.50 and cheques should be made payable to the George 2 User Group.

Apply to Ron Little, Manchester Polytechnic, Computing Services, John Dalton Building, Chester Street, Manchester, M60 2BD.

## Advice to DP managers on how to keep staff

ATTRACTING staff is one thing; keeping them is often a very different matter. Once DP managers and others responsible for personnel matters realise that, they will have gone a long way towards solving their staff problem, according to a report from the International Data Corp.

The report is called Acquiring and Retaining EDP Personnel, and it emphasises the difference between "job motivators", or why a person takes a job, and "job satisfiers/dissatisfiers" — reasons for going or staying.

Salary may be the reason for joining a company, but staff stay because of such factors as good management, promotion prospects, job satisfaction and challenge.

It points out that the state of the computer staff market has led to "escalating" salaries and the poaching of staff.

Managers are also advised to "sell the company to the EDP community", to recruit straight from schools, to use internal training and recruiting, and to stress the need to stay with the company and learn the business before moving on.

## Burroughs launches its Scottish-designed B90 business system in UK

THE Burroughs B90 business computer, designed and manufactured in Scotland and launched in the US late last year (CW, October 25, 1979), was announced in the UK last week.

The new machine, which comes in two models, B91 and B92, is completely compatible with the B80, which it replaces, and while all B80 operating software and packages are supported on it, the announcement includes no new software.

The processor is built from a new Burroughs eight-bit four chip set, which doubles the cycle speed of the B80 processor to 500 nanoseconds. The technology is n-channel MOS. Memory addressing is expanded to 512K bytes, with 128K bytes the minimum capacity.

Entry price for a B91 with 128K memory, 90 chips console matrix printer, display switchable between the 256-character standard of the B80 and full 1920 characters, and six megabytes on two double-sided double-density floppy discs, is £12,000. The 256 character plasma display remains an option on the B90.

Most striking feature of the

new machine is the double-sided double-density floppy disc unit which stores 3 megabytes on a single floppy disc.

Developed in Scotland and at present manufactured only there, it uses a new disc supplied to Burroughs' specifications by three vendors, and as already reported (CW, November 29, 1979) this is to be offered as an OEM product. Apart from the high capacity, the drive also features an access time of 157 milliseconds, compared with the average 250 to 500 milliseconds of floppy drives. To give further protection to the disc, it is stored in an additional rigid plastic sleeve; the sleeve is only removed from the disc once it has been mounted on the drive, and has to be inserted around the disc before the latter can be removed from the drive. The drive is controlled by an integral Motorola 6802 microprocessor.

The B90 is built in Scotland, and at Plymouth, Michigan. Burroughs says that the elements of the Scottish-built systems are overwhelmingly sourced in the UK.

As well as being used in

stand-alone mode, the B90 can support up to eight local terminals, and the 91 model offers two and the 92 model four remote communication lines. The B90 can also be used as a banking terminal controller and can communicate with all other Burroughs computers using the Burroughs BDL protocol. IBM 3270 and 3780, and some ICL protocols are also supported.

The B90 runs under the CMS operating system, and supports up to nine concurrent applications. The same operating system also runs on the B800 and B1900 lines, and languages available under it are Cobol, RPG and Burroughs' Network Definition Language.

Burroughs says it already has more than 500 UK orders for the B90 and that deliveries will begin in February. Over 4,000 B80s have been installed in the UK, some 1,500 of these going to two of the big banks, Barclays and National Westminster.

The two banks want a total of 3,350; Barclays is using its B80s in Burroughs TC 3500 emulation mode, and NatWest is using IBM's SDLC protocol.

## Bridge writer's challenge

BRIDGE writer Victor Mollo has issued a challenge, at odds of five to one, to any computer to beat him either at rubber bridge or a match. Originally the challenge was to expire at the end of 1980 but Mollo said he would be prepared to extend it. His action was prompted by what he saw as the poor quality and high cost of an electronic bridge machine currently on the market.

## Korean phones contract worth \$1,000m

WESTERN Electric International has won a contract from the South Korean government to supply telephone exchanges and to equip local companies to make them. The contract could be worth \$1,000 million over five years.

The present Korean telephone network has a capacity of 20,350 lines based on ITT Metacenta 10CN stored program controlled exchanges and this is to be built up to two million lines using the Western Electric No 1 AESS central exchanges.

Several international telecommunications manufacturers have been negotiating with the Koreans and other contracts may result from the long-range modernisation and expansion of the network.

## IBM drops System 38 emulation for System 3 users

IBM SYSTEM 3 Communications Control Program users wishing to move to System 38 will have to convert directly to System 38 native operating mode. The company has confirmed that the emulation facility for the System 3 CCP announced for System 38 has been withdrawn.

The company also says the new System 38 configurations announced two weeks ago (CW, January 3) supplement the models originally announced and do not replace them.

Memory configurations offered on System 38 Model 3 are 512K, 1 megabyte, 1.28 or 1.5 megabytes. On the Model 5, memory ranges from 512K bytes to 2 megabytes.

While it is unusual for upgrades to be announced to a machine six to nine months before shipments are made, and for the upgrade to be available at the same time as first shipments, the case of System 38 is unusual in that first deliveries will now be made almost a year after originally intended.

IBM insists that the additional memory has nothing to do with the software problems which have held up the machine, and that it simply offers the user more configuration flexibility.

The aids originally announced for transferring programs running under the System 3 Communications Control Program have been cancelled.

System 3 communication users will now be offered aids to convert their programs to run in native mode on System 38. Users have been advised, however, not to expect the aids before May, 1981, although further details will be given later this year.

The new approach, said a spokesman, means that no second conversion will be required, and users will be able to use the full facilities of System 38, which would have been impossible under the original plan.

## CISI acquires French bureau

CISI, the bureau offshoot of the French atomic energy agency, has acquired a controlling interest in another big French CDC bureau, Franlab Informatique.

CISI, which owns SIA in London with a Cyber 175 and a CDC 6600, has a CDC 7600, 6600, Cyber 173 and 172. With Franlab, it acquires a Cyber 171, Cyber 72 and CDC 7600.

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## PEOPLE and EVENTS

## Resignation of ICL MD in Germany

GERD GROBBINK, managing director of ICL Deutschland since ICL acquired the Singer subsidiary there in 1976, has resigned "of his own volition." His stop-gap successor is George Deadman, vice-president of ICL's European Division. The hunt is up for a German national to take over the post from Deadman.

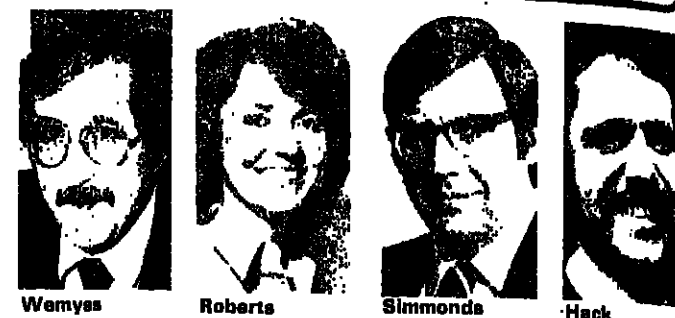
ICL's West German operation was a chronic loss-maker until the merger with the Singer subsidiary there, and Grobbink's appointment as managing director ended a period of rapid management turnover and frequent changes at the top.

Bob Chmley has become a director and shareholder of Merchant Systems, the newly-formed software house. He is to specialise in the design of financial and insurance based systems. He was previously with the English Insurance Company.

Since the merger, the subsidiary has become profitable, and ICL has done much better business, not only with former Singer products but with the 2803 line and other traditional ICL products.

## Systemsolve appointments

THREE new directors have been appointed by Systemsolve, the software and bureau house. Peter Wemyss and Derek Williams have been named respectively as sales director and systems development director. Douglas Eytells, the recently appointed director general of the Computing Services Association and a director of BOC Datasolve has relinquished his seat on Systemsolve's board and his place has been taken by Jim Duck.



Lyndon Roberts has been appointed a sales executive by Mounsey and Partners, the software consultancy group. She joins the company from Telecomputing.

Roy Simmonds has been appointed manager of the chemical engineering division of the University Computing Company. A specialist in heat transfer, he has served on the Heat Transfer Committee and has been a member of a number of working parties set up by the Institute of Chemical Engineers.

Bill Hack has become area sales manager for central accounts South-East with Redifon. He was formerly special accounts manager for Southern region.

Tony Campbell has become an operations director for System Aid (Tour Processing).

## DIARY

JANUARY 22 British Chapter, ACM. Conversation on Parallel Processing. Dennis Parkinson on Chinese Army Approach to Computing. BCS headquarters, 13 Mansfield Street, London. 18.30.

JANUARY 23 Data analysis. BCS Database users. University College, Torrington Place, London WC1. 14.00.

JANUARY 24 Data Protection. BCS Merseyside branch. Department of Science Lecture Theatre. Liverpool University. Brownlow Hill, Liverpool. 18.00.

JANUARY 24-25 IBM CUA programming group. Holiday Inn, Liverpool. Tel: 01-551 1843.

JANUARY 30 Natural language translation. Heriot-Watt University, Grassmarket, Edinburgh. 17.30.

FEBRUARY 4 Meeting. BCS Fortran specialist group. Heriot-Watt University, Edinburgh. 10.45. Tel: 0533 554455 ext 165.

The use of microcomputers in electricity distribution. BCS East Anglia branch. Russell Road, Ipswich. 18.00.

Visit to Open University, BCS Bedfordshire branch. Milton Keynes. Apply via secretary. Tel: 01-837 0471.

FEBRUARY 6 A look at the new Ansi Cobol standards. BCS North West London branch. Railway Hotel, 390 Oldfield Lane, Greenford, Middlesex. 19.30.

FEBRUARY 7 Visit to Lloyds. BCS Kent branch. Chatham. 19.30.

The future of BCS and presidential visit. BCS Chester and North Wales branch. Half-Way House, Connah's Quay, Clwyd. 19.30.

FEBRUARY 12 Map-making by computer. BCS Croydon branch. Fairfield Halls, Croydon. 19.15.

Voice response systems. BCS Harlow sub-branch. Saxon Inn, Harlow. 19.30.

Use of computers in MR weather forecasting. BCS Newcastle branch. Barras Bridge Rectory, University of Newcastle, Newcastle. 19.00.

FEBRUARY 13 Technical directions. BCS Bristol branch. St Vincent Rocks Hotel, Clifton, Bristol. 19.15.

Computers in newspapers. BCS North London branch. West Lodge Park Hotel, Cockfosters. 18.45.

CAD at Ford's. BCS Sussex branch. County Hall, Lewes. 19.30.

Computers in the 80s. BCS Humberside branch. Hull College of Higher Education, Hull. 19.30.

FEBRUARY 14 Here computers any place in the doctor's surgery? BCS Oxford sub-branch. Staff College, Oxford. Polytechnic, Oxford. 19.45.

MARCH 27-29 The changing balance of man/technology. IDPM. Bournemouth. Details: 01-658 0171.

## Award for Frenchman

THE first CII-Honeywell Bull European Prize for Research has been won by Jacques Arsac for his work on the transformation of computer programs.

The prize is to be awarded every two years to people who have made a major contribution to computer science.

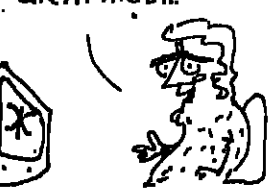
Arsac receives the award, worth 50,000 French francs, in recognition of his innovation in the teaching of and research into computer science and his personal work on functional languages, program transformation and source to source transformation systems.

A graduate of the Ecole Normale Supérieure in Paris, Arsac has held several appointments including professor of programming in the science department of the University of Paris, director of the computer centre of Meudon Observatory and director, then president, of the scientific board of the Institut de Programmation.

Robin Dorricott has been appointed micro systems manager of Capper Neill Controls, the control and measurement engineers. He joined the company in 1963.

## Livreware File

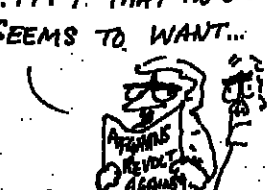
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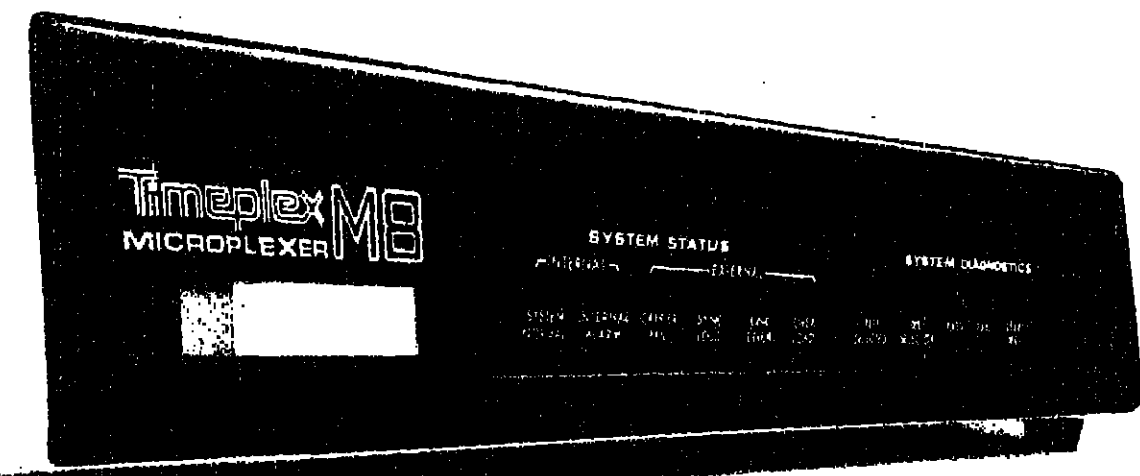
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# MICRO NEWS

## First micro with bubble memory

THE Index System 100, now entering the UK market through a newly formed distributor Dakstate (CW, January 10), is one of the first microcomputer systems to boast the use of bubble memory storage.

Though by no means an inexpensive option on the system, it marks what could be the start of a growing trend, especially in the sector of the market that System 100 is being aimed at — the fully integrated portable computer for the professional.

Based on a Z80 processor, with a minimum of 48K-bytes of RAM, it packs considerable hardware into its 10kg total package.

This includes a Burroughs six line by 40 character plasma display, a mini-floppy disc drive offering either 200K-bytes or 400K-bytes, a 72-key keyboard with numeric keypad, and either a 21-column or 132-column thermal printer. There are also 64 parallel I/O lines and either two or four serial ports.

Other options that can be built in include a battery back-up power supply, an acoustic coupler, and a 32K Basic Interpreter in ROM.

In normal circumstances the Basic is loaded via disc into RAM, leaving 16K available to the user, though the amount of RAM can be expanded up to 2M-bytes with external modules.

Other languages available include Fortran and Cobol, but applications software support is as yet limited. In this country Dakstate is currently negotiating with several software companies, including CAP, for applications software packages.

It is the option of replacing the mini-floppy disc drive with a

## Keen to handle the Pet

A RE-ORIENTATION in market approach is taking place at Keen Computers, for the company has become a Commodore dealer, selling Pet business systems.

Until the middle of last year, Keen had been one of three main distributors in the UK for Apple. Then Microsense was appointed as UK master distributor by the US manufacturer, and Keen, with Personal Computers and Lynx Computers, was demoted to sub-distributor status amid much misunderstanding and acrimony (CW, June 28, 1979).

Dr Tim Keen, managing director of Keen Com-

by Martin Banks

## Isher-Woods moves into small systems leasing and support

LEASING facilities for micro-computer systems costing under £5,000, a hardware and software support programme, an information 'club', and an agreement with software house LD Computer Services are among the new capabilities of Luton-based Pet systems dealer, Isher-Woods.

The company is restructuring itself with an internal division that brings into play two new companies, both aimed at providing services for other micro-computer dealers rather than for the end user.

First of the new companies is Link Financial Services, which will offer through both Isher-Woods and other dealers a leasing facility on the lower ranges of microcomputer equipment.

According to Isher-Woods director Robin Woods, the majority of finance houses that offer these facilities are unsympathetic to the provision of leasing or financing deals on equipment costing under £5,000.

To back up the leasing and financing, Link will also provide insurance services.

Link will become a division of the main holding company for Isher-Woods, Ric Business Systems. This name is being used again for the second new company, Ric Computer Systems (pronounced Rike).

Ric's main task will be a complete back-up for the installation and support of microcomputer systems. This, according to Woods, will include a hardware procurement service, which he describes as holding in stock all necessary hardware components, especially essentials such as connector cables.

Other services offered will be hardware integration, which will include checking out hardware for a week, an installation and commissioning service, systems software support and a maintenance service.

Three levels of maintenance will be offered, ranging from a warranty on all hardware, for 5% of the system purchase price, a 24-hour response service within a 50-mile radius of Luton for 10%

## Small business launch in UK

ANOTHER system is joining the ranks of small business computers available in the UK. It is the Telega 1000 being sold in this country by Sinteron Electronics of Reading.

Based on a Z80 micro, the system incorporates 64K-bytes of memory and a 10-megabyte Winchester disc, in a single box. Communication is via two V24 serial I/O ports and one parallel port, suitable for driving a character printer. To back up the disc, the system also incorporates a cartridge tape drive capable of holding all the data on the disc.

In its standard configuration, the Telega 1000 can support three terminals running multi-user Basic. It can support a wide range of peripheral devices, in addition to the multi-user Basic software, both Fortran and Cobol are available.

A professional "company doctor," Grisanti was called in last May following a coup staged by the directors against the founder, Larry Goshorn.

He said then that he thought the adjustments in General Automation to put it into a better position for rapid growth would take about nine months, and he believed that his task would be accomplished by mid-February.

"I honestly believe that the company will have been repositioned effectively for a new leader by that date. Whether or not I continue will depend on prevailing circumstances and need," he said.

In their roles as joint European managers, Frank Walters will handle sales and marketing while Hans Jarnik covers services and engineering. Walters will be responsible for overall operations in Northern Europe and Jarnik will control Central Europe.

## Bad luck for Apple

A RUN of bad luck over Christmas left Apple Computer's UK master distributor Microsense with several problems and some unhappy dealers towards the end of last week.

The bad luck started on December 17, when a shipment of Apple IIs and accessories was sent to Microsense by the Cupertino California-based microcomputer manufacturer.

HM Customs and Excise decided to give the shipment what is called Channel Two clearance, which means it is investigated more thoroughly than usual, over a much longer than normal period.

Eventually it was due to be delivered to Microsense on the morning of December 31. That afternoon a delivery arrived, but it was one that had been sent by Apple later and contained only Apple II systems, not the accessories such as RAMs and serial interface cards of which Microsense was by now running very short.

That first shipment was rescheduled to arrive on

## Microsoft moves into Europe

THE US software house Microsoft, producers of probably the de facto standard Basic for microcomputers, has formed a new joint company with Vector International of Brussels to cover European marketing of its products.

To be called Vector Microsoft, the new company will have sole marketing rights in Europe, including the UK, for the UK, Ireland, East Europe and the Middle East.

# COMPANY NEWS

## Shake-up of GA's Euro operations

THE European side of General Automation was responsible for the pre-tax loss of \$341,000 reported by the company for the first quarter, ended October 31, of its current financial year.

General Automation's acting president, Frank Grisanti, who was brought in last year to deal with the company, announced last month at the company's annual meeting that European operations were being reorganised.

## COMMENT

## 'As you were' for Logabax

One of the first moves has been handing over the management of European operations jointly to Frank Walters and Hans Jarnik. The former Vice-President of Europe, Walfrid Midler, left the company at the end of December. Taking over from Walters as UK general manager is Campbell McGarvey, an ex-Burroughs regional manager.

Grisanti also revealed that certain sales and gross profit figures from General Automation's Austrian sales office had been incorrectly recorded during fiscal 1979 and that, as a result, the financial statement for 1979 had been amended so that profit before extraordinary credit on the financial statements for 1979 had been reduced by \$213,000.

Grisanti mentioned that a major investment banking firm, which he did not name, had been engaged to help place a value on the company so that the board of directors could respond properly to the overtures from several major corporations that were interested in acquiring GA.

Grisanti also referred to the full audit that General Automation had been put through in April before an intended bond offering. Grisanti pointed out that the offering never took place because the underwriters who had contemplated making it withdrew because they believed GA's operating results up to the third quarter of fiscal 1979 could not support the offering.

He also cited the company's chequered history of performance and discussed the major reorganisation that was taking place (CW, September 13, 1979).

Grisanti explained that the repositioning of the company had been suggested by the Boston Consulting Group.

A professional "company doctor," Grisanti was called in last May following a coup staged by the directors against the founder, Larry Goshorn.

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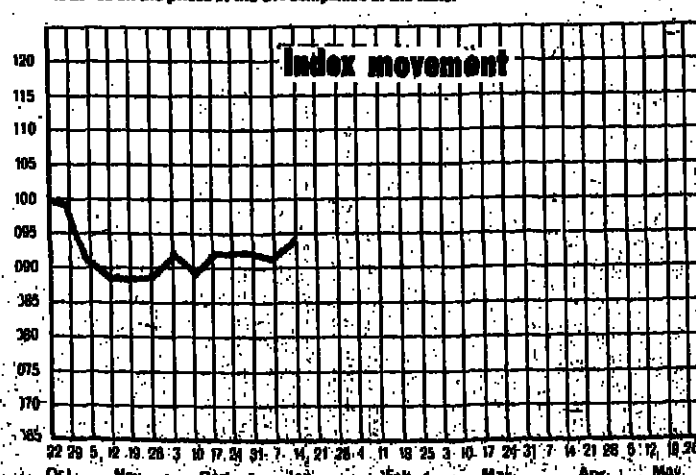
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## CW SHARES TABLE

Pence				Index 84.87				Change +2.47			
1980		1979		1980		1979		1980		1979	
High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
240	230	240	230	240	230	240	230	240	230	240	230
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237	234	237	234	237	234	237	234	237	234	237	234
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114	114	114	114	114	114	114	114	114	114	114	114
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172	168	172	168	172	168	172	168	172	168	172	168
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1148	1132	1148	1132	1148	1132	1148	1132	1148	1132	1148	1132
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207	190	207	190	207	190	207	190	207	190	207	190
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123	123	123	123	123	123	123	123	123	123	123	123
119	119	119	119	119	119	119	119	119	119	119	119
120	120	120	120	120	120	120	120	120	120	120	120

The table shows the closing prices in London and New York at the end of last week. The shares listed are based on the prices of the UK companies in the table.



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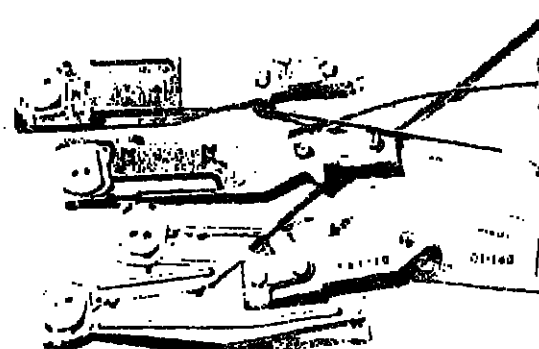
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# MICROSYSTEMS

## Pointer to future

NOW that Christmas is past, and the ravages of New Year celebrations overcome, it is only proper that the new decade should open with an exhibition dedicated to that potential hope, and, of course, all our futures — the micro.

Microsystems 80, the first of the pukka exhibitions and conferences geared to illuminating the application and potential of the microprocessor and microprocessor system, starts the year for the third time in succession.

A trendsetter in many ways, it is about to set another, having outgrown the West Centre Hotel in London's West End and moving North to the Wembley Conference Centre.

Opening on January 30, at 9.30 am, it will run for three days, and will again follow the trend set from the start.

This is that the market for micro-based products and applications is extremely wide and transgresses traditional market barriers such as "industrial", or "business and commercial", or even "hobbyist". All are fair game for the micro, as it has already often proved.

Microsystems 80, which is sponsored by Computer Weekly, has managed to reflect that diversity of application, never centring its interest too strongly in any one area.

This year's event will be no exception. For example, in the industrial area where many of the long-term wealth-creating gains should eventually emerge, the exhibition will provide several stands of considerable interest — particularly so for potential users who can see a market opportunity in their own area, but lack the necessary skills in hardware and software engineering. Microsystems will have several consultancy companies and development systems manufacturers present for such people.

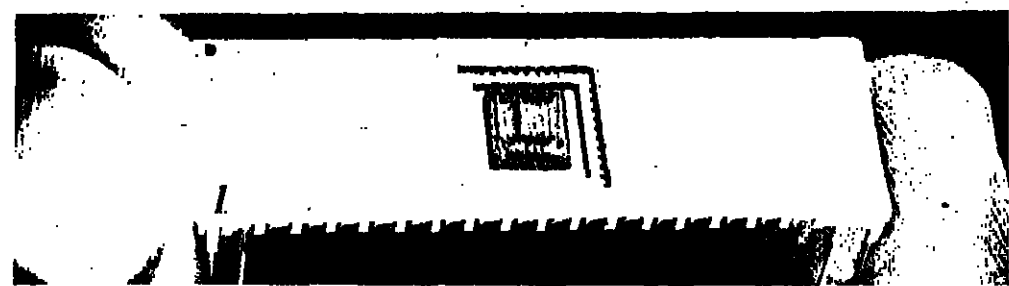
The Sira Institute is an example. This is an independent technology centre specialising in developing systems for measurement and instrumentation. For those seeking the knowledge needed to become proficient in the wonders of microcomputing, the Institute also runs a series of courses.

As part of its showing Sira will demonstrate a gas flow computer, developed in association with KDG Instruments, and a new kit specifically designed for hands-on training.

Training is still a very popular subject and will be liberally represented. Companies such as Integrated Computer Systems and Bessdale Computer Systems will be in attendance.

The industrial market is a rich area for consultancy companies, and some of them will be on show at Wembley. Hugh Pushman and Associates is one of them. This company offers advice on the application of microprocessors, and assistance with the design and implementation of hardware and software.

On its stand, the company will show its new Futuredata unit.



The only European designed chip, Ferranti's F100-L.

ment in this area will be Hewlett-Packard, and Ferranti. HP entered the development systems market towards the latter part of last year, with a multi-station multiprocessor set-up which allows several systems designers to work simultaneously on different projects. This will form the centrepiece of the HP stand at Microsystems 80, though the recently introduced HP-85 personal computer should also make an appearance.

With software for business microcomputers to a large degree more important than the hardware, Microsystems 80 will have its fair share of companies that specialise in this field. Micro Focus will be present, showing its CIS-Cobol compiler, while Petsoft will demonstrate both its low and high end software packages for the Commodore Pet computer.

Most major suppliers, manufacturers and distributors of systems and hardware will be in attendance, including Comart, which handles Cromemco and Horizon. Research Machines, with its education-based 3802 system, and Commodore with its Pet.

Joining Research Machines as representatives of UK expertise in computer systems design and manufacture will be Rair with its Black Box, Trivector Systems and Transdata with its Cx 400 business system.

In the area of peripherals, Comma Computers will show a new range of colour plotters from Brown Boveri, and Anadex a new printer in its range that can operate at 132 or 220 character line lengths.

Ferranti, still the only European semiconductor company to design and produce a microprocessor, the F100-L, will show a development system designed especially for this processor.

Another important sector that will not be ignored is the small business area, where the growth in the application of microcomputer systems has been nothing short of phenomenal.

In its wake this growth has brought a whole new sub-sector

of the computer industry into prominence, starting with the upsurge in the number of shops and quasi "retail" outlets. Among the representatives of this group at the show will be Pet systems specialist Isler-Woods and a newly-formed company, Interface Components, which specialises in Nascom products.

The three are the conference sessions proper, a buyers' forum, and professional development courses.

The conference sessions themselves will, over the three days, cover developments in micro technology and putting micros to work during the first day; systems design and specification, plus software and microsystems for the second day; while the third day will be given over to the new traditional subject of personal computing.

The buyers' forum, a new feature this year, will also, over the three days, establish the criteria for the effective selection of hardware and software products.

The one-day professional development courses, also a new feature to Microsystems 80, are being organised by Integrated Computer Systems. They provide an introduction to micros and to Pascal for managers and engineers.

For further details and registration information to the conference, contact Business and Industrial Training, Room 814, Dorset House, Stamford Street, London, SE1 9LU.

Microsystems 80 will feature three days of conference sessions as an essential adjunct to the exhibition. This year it is being split into three distinct areas, each of which should appeal to most users and potential users, writes CWT's Micro News Editor MARTIN BANKS.

## Complex technology needs new standards

AS microcomputers grow up, attention is turning more and more to the systems environment in which they are used, rather than the actual components themselves. This follows the well-established trend in the technical computing and DP fields.

Some 25 years ago there was considerable interest in processors, and indeed one had to be something of an expert to use computers at all.

Today, processing power is taken almost for granted in many cases, and the emphasis is almost wholly on the systems mounted on the hardware and standard software, rather than the standard components themselves.

There are already signs that the 1980s will be the decade of the microsystem — here the word system is used to represent the sum of hardware plus software plus documentation.

Two types of microsystem are emerging as quite different types. The first are dedicated microcomputer systems, the type often found within products. Once programmed, they are normally left well alone since their life is almost certain to exceed the life of the product they are controlling.

In other cases, microprocessor systems may be adjuncts to larger systems or be stand alone transaction processing systems in their own right. In these modes they must necessarily be multi-function systems.

Again, there are already signs that even 8-bit machines configured to form multi-function systems are beginning to compete with, and displace on cost grounds, many of the smaller minicomputers previously used. For example, one such system can support up to 320 megabytes of rotating store linked by one, or optionally more, 8-bit chips.

As interest grows in systems, rather than hardware and software components, many users are seeking modular hardware and software components which can be rapidly configured into the required form, so that attention can concentrate on systems specification, design and development rather than working with system components such as chips — a time-consuming activity with few rewards.

One of the most interesting developments emerging is that of card-based systems. Such modular systems allow users to select cards from a catalogue — often exceeding 100 different cards, plug them into a bus system which interlinks them, add corresponding and conceptually similar modular software components, and then simply develop and run their target systems.

The approach offers many other advantages, such as maintenance by substitution when a module fails, and relatively easy interworking and open working of such systems via standard bus protocols and systems.

Another very important aspect of microcomputer systems now very definitely falling into sharp focus is the area of collectively to include technical standards, such as communications procedures and protocols, which ease the interworking, interconnection and hence development of microprocessor systems, and procedural standards, such as system

IT is fitting that at the start of a new year, and a new decade, the first exhibition in the computer industry's annual calendar should be about the micro.

To coincide with the Microsystems 80 exhibition and conference, Computer Weekly has asked several people from the micro industry to look at some of the major aspects and trends for the future, coupled with a preview of both the exhibition and conference themselves.

In this article, FRANK TAYLOR of Systems Technology Consultants looks at how the technology of microelectronics is rapidly changing to the technology of microsystems. This, he suggests, is leading to a much greater need for standards on which microsystems can be universally based.



Frank Taylor (pictured above) entered DP in 1956, initially as a digital systems designer and early user of a Ferranti Pegasus computer. He worked with early minicomputers in the mid-1960s and microcomputers in the early 1970s. He spent 11 years at the NCC and formed his own consultancy in 1978 and is also active in the BCS.

documentation and programming standards, which maximise the benefits gained from human efforts aimed at originating and generating good systems.

The area of technical standards, both hardware and software, will form a review paper during the forthcoming Microsystems 80 conference — the review of hardware standards will start at the grass roots level and look at the environment surrounding chips, and rapidly work upwards to review such areas as bus standards and data communication standards.

The software review will cover status of standards defining the now available languages on micros, such as Cobol, Pascal and Fortran. The brief review of systems standards will look at the so-called "human standards" in perspective, including standards for progressing projects, recording systems work, and programming standards suitable for use in association with microsystems. There will also be a very quick look at adapted structured programming standards.

Such standards taken collectively are most certainly seen as a key element in the future development of microprocessor technology, since they will determine the rate of realisation of the benefits which may result from the application of the technology.

In some ways the microcomputer field is a very different ball game to the data processing and technical computing areas, particularly where micros are dedicated within given units, and effectively form a complex, software programmed electronic controller.

In other cases, where they form an adjunct or replacement for larger computers, the technology is very similar to that used in connection with the larger classes of computer. Hopefully, if standards are applied carefully and sensibly as and when required, some of the problems encountered in the development of the technology of the larger computers will be avoided.

In particular, it is hoped that some of the massive conversion problems will not emerge again.

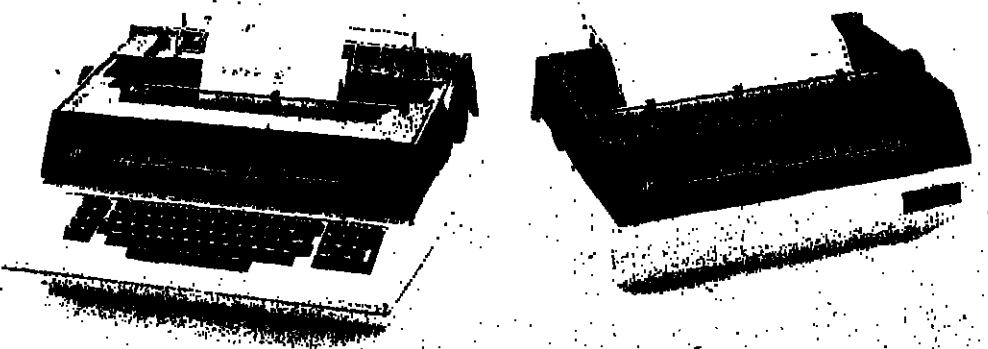
As the technology becomes more complex, it will be more and more important for user organisations to determine a strategy for the acquisition and progression of microcomputer systems which can be applied prospectively rather than retrospectively.

Particular care must, however, be taken not to inhibit development. For organisations not attempting to keep pace with the latest technological developments, the definition of a cross-company strategy covering a forward period of three to five years is already a possibility.

In other cases, when companies are tempted to keep pace with technology, such a strategy becomes in effect a moving target — constantly updated as and when each major advance occurs which must be adopted by the company and incorporated into its policies.

Which of these two approaches should be taken by a given organisation depends very much on the number of microprocessors it proposes to use, whether or not their technology is being stretched and hence advantage must be taken of new

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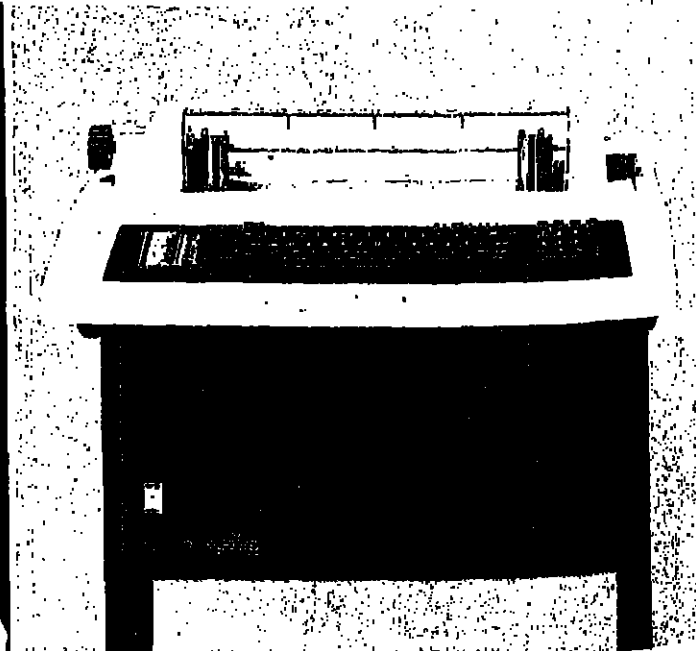
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# Age of software engineer approaches

THE development of cheap microprocessors enables computing power to be used in products and processes where previously it has been uneconomic.

Engineers with little or no experience in designing computer based systems (and, in some cases, with no electronics experience either) are now expected to design microprocessors into their company's products and processes.

What are the problems they will encounter, and how do these differ from the data processing problems?

Certain aspects of designing software for microprocessors are different from designing software for "traditional" computers, namely minis and mainframes.

For example, the software for a microprocessor works on its own. There are no operating systems which control the operation of the devices which are attached to the system. In microprocessor-based systems this is done by the software of the user.

A second aspect of software design for microprocessor-based systems is that they work in real time. This means that the microprocessor must input the data associated with an event, process it and output the result to the devices it controls, within a fixed period of time. The design of real time software requires a high degree of skill on the part of the engineer.

Furthermore, programs must be re-entrant: external interrupts must be processed without losing data from the interrupted routine and the interrupted

routine must pick up where it left off, once the interrupt has been serviced.

So who should design and develop microprocessor-based systems? Engineers, electronics or otherwise will understand the basic electrical and mechanical realities — timing, response times, electrical and mechanical limitations — but may have little software experience.

They will be unable to benefit from the lessons learned over

years? Which signals are generated spuriously by electromagnetic interference, switch bounce and other extraneous noise sources, and which are genuine?

Ideally, the design and development team should, therefore, be led by an electronics engineer and contain an experienced programmer as well as a mechanical or other engineer where appropriate.

The design of the system

method of programming has yet evolved, there are techniques which to a greater or lesser extent can be successfully applied to designing microprocessor-based systems.

These techniques are called "structured programming": they not only result in a better designed product but also give managers a tool which they can use to monitor the development of the microprocessor based product.

signs and produces is reliable and works under all conditions. It is the acquisition of these skills by engineers that is of vital importance.

Engineers must be trained in these skills; failure to do so will invariably result in the microprocessor based system they build being unreliable, difficult to maintain, over the budget and behind schedule.

In most cases — unless production runs of many thousands

Pascal has emerged as the front-runner and compilers are now available for many micros. So Pascal is the recommended high level language for microprocessor-based systems.

This is not to say that there is no place for assembler languages. High level languages generate more code than the equivalent assembler program. This results in slower execution and the need for more memory.

The design of the hardware involves designing both the computer section (the microprocessor, memory and input/output interfaces) and the interface to devices the microprocessor monitors and controls.

Building the computer section of a microprocessor-based system is not difficult. Microprocessors and their related devices such as ROMs, RAMs and input/output latches are devices which are highly reliable with well defined characteristics.

Interfacing the microprocessor to the devices it monitors and controls can be more difficult, especially where the input data is in non-digital format.

To ensure that the data is correctly sampled and read by the microprocessor requires the designer to have a thorough understanding of the interface problems and be able to recognise good data from spurious noise.

Just as the mature sciences of physics, chemistry and biology have spanned the hybrid biophysics and biochemistry, the fields of data processing and electronics are creating a new type of engineer.

This hero is the VLSI software engineer.



Jolly

MOST industrialised nations of the world have now accepted the challenge of microelectronics and have responded to it in different ways — from within industry, at a national government level, and from trade unions.

This response can be seen as a reaction to the dominance of Japan and the US in microelectronics and in the products derived from the application of these components.

Japanese and US companies have seen the opportunity, developed the technology and exploited it fully using their abilities in management and in marketing to push their products internationally.

It seems then that most European nations are now reacting to an imposed situation rather than being creative in their own right. Many nations have varying levels of industrial or government-supported interests at present, and in the short to medium term one hopes that such support will significantly strengthen a nation's activities in adopting microelectronics.

However, in the not too distant future, and most likely as a consequence of all these national programmes of support, businesses throughout Europe will be competing upon roughly equal terms where microelectronics application are concerned.

We are faced with a dilemma. We are being encouraged to innovate, we may have government money to help us innovate, we have had government money to support research. Similar activities exist in other countries and in due course all nations may still find themselves on equal terms.

The competitive environment will not have changed significantly for those companies using advanced electronics in automation and industry, but the competition certainly will be tougher for those businesses and countries that do not take advantage of new technologies.

During the past two years the vogue of microelectronics and, in particular, the microprocessor has led to an extraordinary debate across the industry. The media has had a field day, reporting the chief pundits in this debate, while training courses and conferences on various aspects of the microprocessor and its effect are ubiquitous.

There are many well worn arguments about the detrimental effects of microelectronics on industry and society, but I suggest there are many positive points to be considered.

Discussion engenders awareness and hopefully some deeper understanding about the consequences of our actions, or lack of them, concerning this new technology.

The awareness activity provided by the Department of Industry as part of the MAP project is, in international terms, unusual and interesting and has undoubtedly been of benefit to all of us, in society and in industry, in moving from a general atmosphere of indifference two years ago to an environment

# Management must face challenge of 80s

where there exists a desire to be informed about microelectronics and its applications.

The MAP activity includes the provision of awareness courses for managers in industry in general and has the advantage of alerting management to the benefits of one particular area of new technology.

In an ideal world the same managers should really be alerted to the benefits of other developments in a wide range of areas such as mechanical engineering, ergonomics, production engineering and chemical engineering as well as data processing and software technologies.

Part of any awareness activity is to encourage innovation on the one hand and the improvement of older designs on the other. Unions, government and training organisations have been quick to respond to these new challenges and the material produced by these bodies has been of a particularly responsible and informative nature.

However, all this activity centred around the microprocessor has only served to illustrate a fundamental and major weakness in our industrial management structure — its unresponsiveness to technological change in general terms.

Perhaps on the threshold of the '80s we should now be concentrating our efforts on being more responsive to the general aspects of technological change of all kinds.

The fact that the microprocessor pervades all industrial sectors further emphasises this particular point. It is inevitable that such a pervasive new technology is difficult for one sector of industry to understand while easier for another.

The industries to which such new technologies are applied are not only multi-dimensional but also multi-disciplinary. Sadly, it is therefore difficult for management in any industry to fully appreciate all the benefits of any new technology that may be applicable to a company's business.

It seems, therefore, that if we are to make a success of these efforts, to generate new products based on a variety of new technologies (not just microelectronics) then perhaps some attention must be given by management to the adoption of new skills and disciplines as management functions, and to do this as quickly as possible.

Here are some areas worth considering.

Delegation or segregation of technical responsibilities. In some companies, particularly in Europe, there has been a recognition of the importance of specific technologies to some companies. I have seen many firms where, for example a manager for computer aided design exists, or, for example in a mechanical engineering company a manager for an electronics research group. It is one thing to create such positions but quite another to create them with authority and budget responsibility.

Identification and exploitation

of in-house innovative skills. I am sure that in most companies a wealth of good ideas could be forthcoming for new products if the appropriate management skills (including marketing) were applied. An element of in-house training for design staff on product development and company marketing plans may well achieve positive results.

Strengthening of internal R&D. In my judgment some additional attention can be given by many companies to appropriate R&D activities, particularly in areas relating to product development, reliability, quality and design. It is becoming all the more important that management positions of authority, again with budget responsibility should exist in this area.

Marketing, sales and new opportunities. To what extent do our British marketing managers really understand in-

ternational markets when they introduce a new product? In many cases products are developed without an adequate look at the needs of the market, or quality requirements and so on. A properly estimated market leads to the introduction of the right product at the right time.

To conclude I would suggest that there are still several companies, large and small that would benefit from careful introspection into their structure

and responsiveness to the new technologies. Perhaps we should take the heat off the microprocessor and concentrate instead on creating a new vogue for the 1980s. This would be encouragement to management to consider some restructuring to cope with rapid technological change.

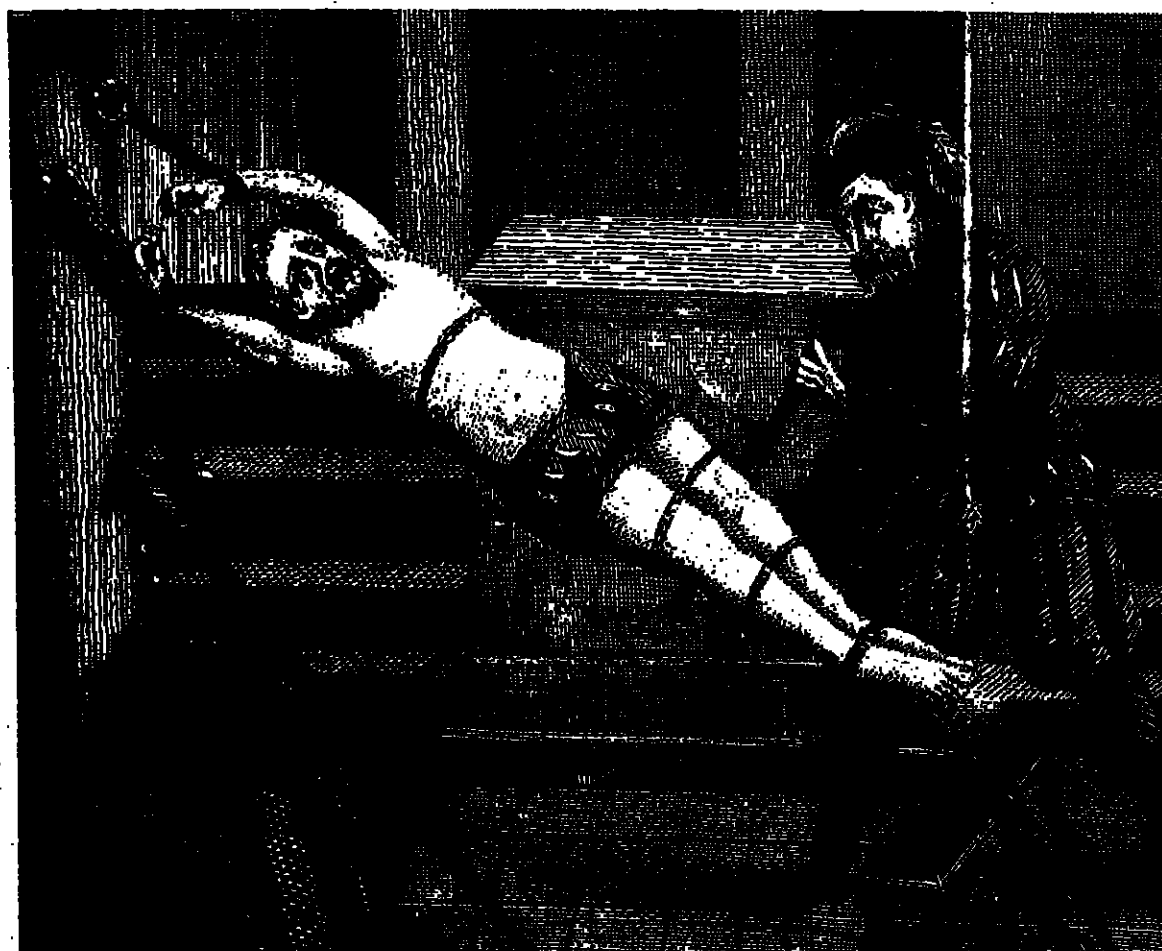
Some of these changes are taking place in industry with good effect. Can it be made to happen faster?

THOUGH the Microprocessor Applications Programme and awareness schemes run by the Department of Industry are, in international terms, unusual and interesting, they have served only to illustrate some fundamental weaknesses that exist in the management structures of UK companies.

So argues BRIAN JOLLY, (pictured left) director of Sytek Consultants, in this article. The major weakness he cites is the unresponsiveness of UK company managers either to consider or implement technological change in their thinking or products. To overcome this, he suggests that new skills should be included as part of the management function.

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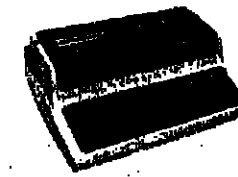
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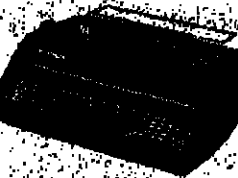
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## MICROSYSTEMS

# High level of 'integration' a route to better software

WHEN the designer sits down to formulate a system based on microcomputer technology he is faced with a multitude of choices not only of the device to use but how best to approach the design philosophy.

For example, does he need to produce his own boards or does he need to buy in ready-built boards from another manufacturer?

There are various reasons for choosing either approach but it should be borne in mind that the consequences of this initial choice are long-term and affect the whole manufacturing cycle.

It is not intended here to describe the merits of the various microprocessor devices that are on the market, for example the Motorola 6800, Intel 8085A or Texas Instruments TMS 9900.

All these products are well documented and there are numerous articles describing the relative merits of each device — the designer has only to refer to these to make his own decision.

However, there are many more difficult problems to be faced. The first question will be whether to make your own computer boards or to purchase them from component suppliers.

All manufacturers are very helpful and produce single board computers that the user can implement to solve his own problem.

Even assuming that the user



The configuration of a computer system, be it a microcomputer or a mainframe machine, fundamentally consists of two major elements, the hardware and the software.

The growth in the complexity and capability of hardware design resulting from advances in microelectronics, especially in microcomputer systems, now means that an increasingly large part of the work involved in developing a computer system is represented by the software development.

decides to implement his solution using the manufacturer's own cards, he is still left with the problem of how to design the entire system concept, since there are many choices and the cost advantages and disadvantages are often not realised until too late.

One of the first problems that must be faced is whether we are designing a general purpose piece of equipment or whether it is a totally integrated system. If we consider the design of the generalised computer for business use, then we can see several examples of what are called totally integrated design, for instance the Durango D85 and the Commodore Pet.

These are not designed around a bus structure, or somebody's particular boards, but as a complete unit and thus they appear as such to the user, having little or no expansion capability without the introduction of fairly complex interfaces.

The alternative approach is

One of the leading contenders in the small business microcomputer stakes to come from this country is the Rair Black Box, a system based on the Intel 8085A microprocessor. With up to 64K-bytes of internal memory, and over 1 megabyte of high capacity disc storage in an integral unit, it is now also offering a new hard disc option. This will be seen for the first time at Microsystems 80.

typified by a company such as Digital Equipment which designs general purpose equipment based on a mass of boards that connect into various chassis. These are usually designed for OEM and purchased by software houses for implementation.

However, this approach can produce solutions which are not always what the user would like. With this approach presentation and software design have to be tailored to suit the particular machine and thus the overall objectives of the equipment are often compromised for the sake of the so-called general purpose design.

Unfortunately, these types of machines are trying to be all things to all men and therefore cannot possibly succeed. Although quite adequate solutions have been produced in this fashion in the past, the advent of the microcomputer has enabled us to achieve at more reasonable cost, much more in-

tegrated solutions; solutions which do not pretend to be all things to all men but which can be made to produce what the customer wants rather than what the customer wants adapted for a computer system.

This philosophy must affect the internal design of the machine. Thus regarding the choice of bus structure: Whose or what boards should be used? Or should I make my own boards at all? Such questions are seen in a new light by this approach.

It is essential from the design stage that the software and hardware are treated as an integrated unit. The idea of adapting software to fit is often the most disastrous that can be used.

Choice of bus structure for the internals of the machine is a bewildering task. There appear to be two well defined microcomputer bus structures available at the moment.

These are the Intel Multibus and the IEEE S100 bus. Unfortunately, the use of the word "standard" in referring to the S100 is a bit of a misnomer. It has taken some time for IEEE in the US to establish any sort of standard, and the so-called standard bus is anything but.

Each manufacturer has implemented the S100 to suit its particular requirement and has often overlooked the possibility of the customer requiring to use somebody else's boards in its machine.

The Intel Multibus, however, is much better defined but suffers the big disadvantage of being very expensive, besides which Intel is anything but helpful in its encouragement of manufacturers to design their own cards to suit it.

There are a plethora of other buses which cannot be accepted as standard and should the user decide to choose a particular manufacturer's boards, then he

Here PETER JACKSON (pictured left), technical director of Modular Business Systems, puts forward the idea that by using even higher levels of "integration", board level microcomputer sub-systems built round a standard bus structure, the hardware design problems can be reduced to the point where much more time can be spent on the all-important task of producing the software that makes the total system.

real time and in multiprocessor systems this can be problematic.

Newer designs are coming and emulators are getting nearer to real time.

However, one must never underestimate the task of trying to debug and rectify a malfunctioning processor card, in particular effects due to bus propagation are often ignored in the simplistic design seen in electronics magazines.

But with current processor technology allowing ever-increasing speed, delays due to a bus protocol device can be very embarrassing and systems which work on the limit of a bus specification often exhibit symptoms not unlike intermittent faults.

This can often lead to disaster. To designers not used to working with microprocessors, to whom digital systems either work or don't, the concept of a system working only sometimes can be extremely embarrassing.

Another important aspect is to ensure that there is a second source for the components used. Some manufacturers, who are first out with a device, are often not interested in maintaining production for a very long period, and the second source manufacturers are often the best bet in terms of cost and delivery.

This, of course, may mean that the first design prototypes are very expensive since they are purchased from the original design manufacturer, but later on, costs can come down dramatically.

To sum up, the following points should always be noted

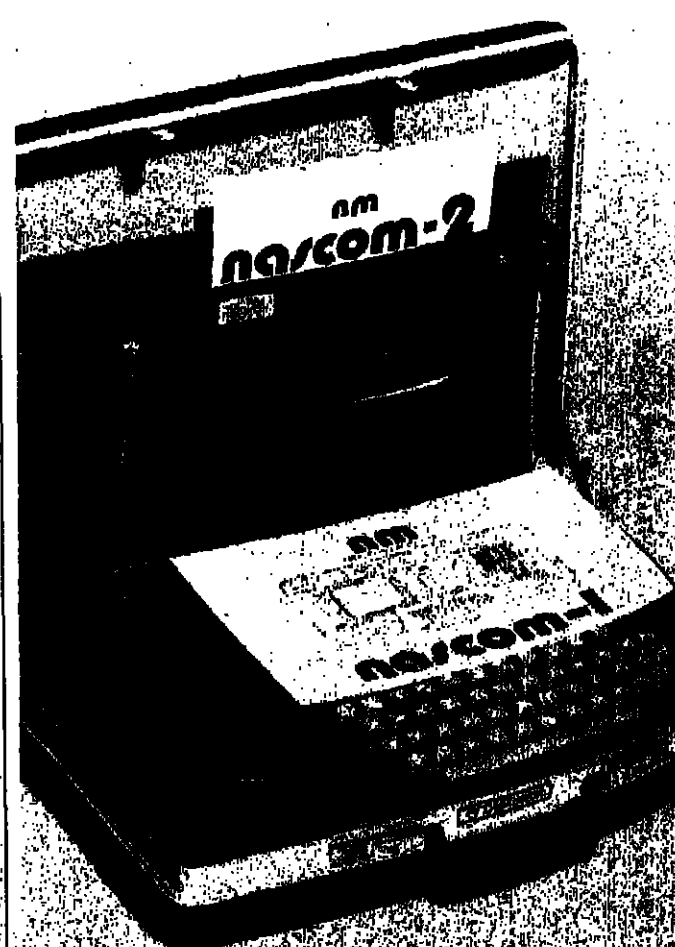
1. Do I use a standard card from a manufacturer?

2. Do I manufacture my own cards?

3. Am I looking for a generalised solution?

4. Am I designing a totally integrated machine?

Only when the designer has totally satisfied himself on each of these points should he proceed.



One of the novel ways in which microcomputers can be used is shown at Microsystems 80 by Portable Microsystems. Called the NaCom 2, it is essentially a NaCom 2 kit mounted into a briefcase. One of the main aims of the NaCom 2 is to make the system's portability make it easy to move around classrooms.

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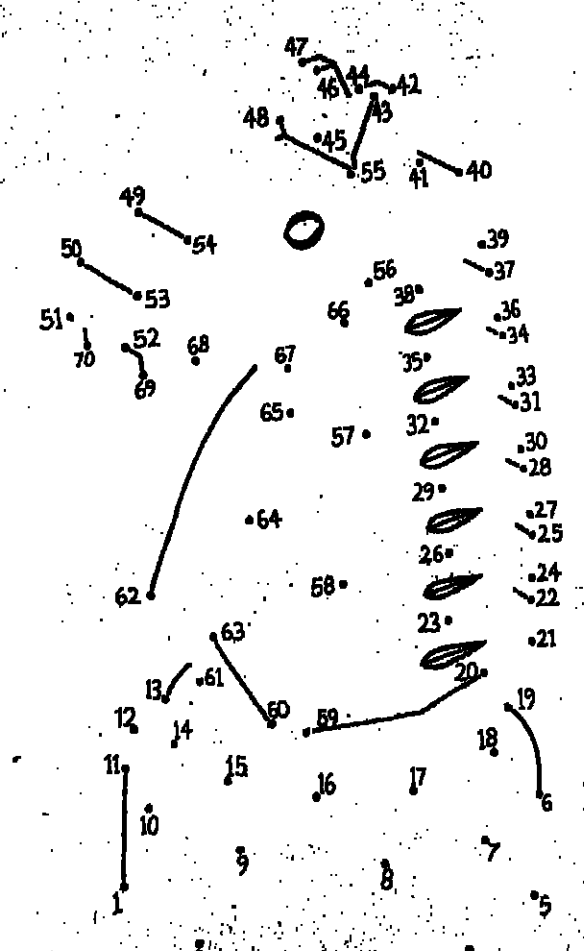
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## OPERATIONS PEOPLE -

### Your skills are in demand!

We have many clients who are actively seeking staff to fill important posts within their operations departments.

Below are just a few of the jobs currently available. If none of them match your skills, contact us and tell us what you are looking for.

### WITH OUR EXPERIENCE, IF WE CAN'T HELP YOU - WHO CAN?

OPERATOR	1yr + DOS or OS	WEST MIDDX.	£5,500	2 Shift
OPERATOR	2yrs + 1900 or 2900	FELTHAM	£5,000+	3 Shift
OPERATOR	6mths + OS/MVS	CROYDON	£4,500	3 Shift
OPERATOR	2yrs + OS/JES2	CITY-BENEFITS+	£5,000	3 Shift
OPERATOR	1yr + DOS	WEST LONDON	£5,500	2 Shift
DATA CONTROL	2yrs + I/O Exper.	WEST LONDON	£6,000	Days
PROD'n. CONTROL	Strong OS/JCL	CROYDON	£6,500	Days

Contact the Operations Consultant at Croydon for further information. Quote Ref. CW102-P.

COMPUTER AND PERSONNEL CONSULTANTS **CAPP ASSOCIATES** LONDON AND MANCHESTER 01-686 9693

## ★ NORTH WEST ★

### MANCHESTER ASSEMBLER PROGRAMMERS

If you have around 2 years IBM ASSEMBLER experience our client will offer involvement in Data-base and on-line systems on IBM 370, and later 4341. Experience of CICS and retail systems an advantage but not essential.

### PRESTON PROJECT LEADERS

This major organisation is planning a sophisticated network based on the latest mainframe and mini hardware. They now require a number of mature staff who have in-depth experience of DISTRIBUTED PROCESSING from either a technical or applications viewpoint.

### MANCHESTER SUPPORT ANALYST

Our client, one of the largest mainframe and mini hardware manufacturers require a pre-sales support analyst. You will have around 2-3 years experience and the ability to provide an advisory and analysis service to potential users.

### PRESTON SYSTEMS ANALYST

If you have around 2 years experience in a fairly large environment our client can offer the latest IBM hardware and systems. You need good experience, on any hardware. Programming knowledge an asset.

### CHESHIRE REAL-TIME HARDWARE DESIGN

This prestigious client requires further hardware design expertise in the real-time process control area. Conditions of employment are excellent as are career progression possibilities.

### MERSEYSIDE SENIOR ANALYSTS

Our client offers training on IBM CICS, DL/I and SNA techniques where required. If you can combine a programming background with in-depth analysis experience, this is a unique opportunity with a progressive company.

### MANCHESTER SYSTEMS ANALYSTS

This company will install a 4341 later this year, and requires analysts with good IBM experience together with some on-line and data-base exposure, preferably in a retail or general commercial installation. Prospects are excellent.

**LORIENT** Recruitment Consultants  
OCS House, Servia Road, Leeds LS7 1NJ  
Telephone 0532 444185  
COMPUTER SERVICES (24 hour telephone service)

### DERBYSHIRE SENIOR SYSTEMS ANALYSTS

A major IBM user currently seeks two additional senior systems analysts to work on on-line manufacturing applications. Applicants should have gained 3-4 years general analysis experience. In addition to an excellent salary, the successful candidate can look forward to involvement on the latest data-base techniques.

### DERBYSHIRE SENIOR PROGRAMMER

This multi-machine installation is seeking an additional senior programmer who has gained around three years IBM COBOL experience, to work on a wide range of manufacturing systems, including data-base techniques. Salary and benefits package is totally negotiable.

### BURY ANALYST/PROGRAMMER

Our client is looking for a 2-3 years experienced analyst/programmer, who has had some involvement with DEC minis using DIBOL. The position will give involvement in a wide range of turnkey systems. This is a varied and highly interesting job in an exciting environment.

### NORTH CHESHIRE COBOL PROGRAMMER

Our client currently has 1902T hardware, which will shortly be updated to 2905. A programmer with around 2½ years experience is required to work initially on batch systems whilst receiving on-line training. Excellent salary for the right person in a small, friendly and expanding installation.

### NORTH MANCHESTER COBOL PROGRAMMER

Our client is interested in a programmer with around 2 years commercial experience. This position offers an excellent opportunity to join a manufacturing company and receive training on data-base and communications.

### Phone STEVE SYKES or GORDON FORBES on

LEEDS (0532) 444188 (daytime) or STEVE SYKES on LEEDS 662417 (evenings and weekends) for these or any other NORTH WESTERN vacancies or write with brief details (no stamp required) to Lorien Computer Services, FREEPOST, Leeds LS7 3YV.

### SENIOR SYSTEMS ANALYST

Our clients based in Surrey who have a 2900 using COBOL and FTLA, are seeking to recruit a Senior Systems Analyst with at least 5 years' systems experience in a commercial environment. Must have some supervisory experience.

### PROGRAMMING TEAM LEADERS

Large company situated in the City are looking for 2 Programmers who have had at least 4 years' experience with ICL COBOL and have led a team of Programmers on a project. Real time of the experience an advantage.

### SENIOR PROGRAMMERS/SYSTEMS PROGRAMMER

Large financial organisation based in Central London are looking for 3 Senior Programmers (all Systems Programmer, who have had at least 4 years' experience and have successfully completed projects on mini computers, i.e. DEC, DATA GENERAL. Fringe benefits include cheap MORTGAGE, Personal loans, season ticket loans.

### RPG II PROGRAMMERS

We have a number of clients in Central and West London who are seeking IBM RPG II Programmers, with at least 2 years' experience. Plenty of perks including one offering a cheap MORTGAGE.

### ICL GEO 2/DME OPERATORS

Major company based in West London require 2 Operators with 10-14 months experience, for two twin 2900 machines. This is a challenging installation with good prospects. Fringe benefits include subsidised canteen, Pension Scheme, 4 weeks' holiday.

### ICL 2900 OPERATOR

Large travel company based in London require an Operator with 6-12 months experience on IBM machine. Benefits include Free Holiday, LV's, Season Ticket Loan.

### IBM OS SENIOR OPERATORS

This is an excellent opportunity for an Operator with approx. 3 years' OS VSI exp. to join a leading financial organisation based in C. London. As standards at this installation are extremely high prospective applicants are expected to be technically competent and fully conversant with JCL and Utilities. Prospects for career developments are excellent and fringe benefits include a MORTGAGE, annual HONUS, LV's and mileage allowance.

### IBM OS OPERATORS

12 months' OS experience is a requirement for this City based company utilising a newly-installed IBM 3031 under OS VSI. Ambitious Operators will benefit from the outstanding prospects in IBM Management or Technical Support. Sub MORTGAGE, Restaurant and LV's.

### IBM DOS OPERATORS

We have a number of clients in and around the London area who are seeking Operators approx. 12 months DOS exp. Positions are currently available on mid-range IBM 370 hardware. Most of our present requirements are for companies installing New Range equipment (4331, 4331) this year. Shifts and Benefits vary.

### Computer Two Thousand

Data Processing Personnel Consultants  
217-218 Tottenham Court Road  
London W1P 9AF  
Tel: 01-636 7584 (24 hrs)

makro

## smooth operators...

...supervisor and team for a streamlined on-line system

Makro is part of the world's largest self service wholesale organisation. In the U.K. we have 7 giant stores already trading. The big news for 1980 will be the opening of our new West London centre in the summer, employing over 350 people and a multi million pound turnover.

Makro is a perfect example of the modern computerised store where stock movement and control, invoicing and customer files are all managed automatically. The new store in North Acton needs a complete team of operators to keep the dual Hewlett-Packard system running smoothly and efficiently twenty four hours a day.

The Operations Supervisor who should have previous leadership experience will earn from £5500, the Operators with at least a year's IBM or similar experience from £5000. In addition you will receive overtime and unsocial hours payments.

Makro offer really competitive employment packages including life assurance, health insurance, pension scheme and the facility to purchase food and non-food products at wholesale prices - that's a big bonus. There are also excellent career development prospects.

Interviews will be held in the London area. In the first instance write to telephone our head office: Miss S.K. Greenwood, Personnel Services Manager, Makro Self Service Wholesalers Ltd., Emerson House, Albert Street, Eccles, Manchester. Tel: 061-707 1598. Please quote reference CO/CW.

## A Technical Sales Specialist

US Company/European Division/  
London Based

Outstanding opportunity now exists for an experienced technical sales person to join a US Company that has recently reorganised to undertake direct marketing of its products.

The primary functions are to market printing terminals and line printers to large volume OEMs. Activities also involve contacts with small OEMs, distributor and occasionally end users. To ensure success in this highly competitive field, the Company is looking for a self motivated imaginative professional with substantial sales experience in Data Terminals, Intelligent Terminals, Computer Peripherals, mini/computer systems, line printers or other closely related products.

Whilst such experience should preferably involve OEM markets, project selling to users of sophisticated small

systems, and communication network equipment are very acceptable alternatives.

The successful candidate, male or female, will be articulate and will be able to liaise at every organizational level. Additional languages, while not essential would be beneficial.

A competitive salary will reflect this Company's determination to attract top quality applicants. Career prospects are excellent as would be expected in such a large multi-national Company.

Please write to Mr. S. Smith, A.K. Selection, 20 Soho Square, London W1A 1DS, or telephone 01-734 6404 Ext 420 for an application form quoting reference number C/87/75. Companies in which you are not interested should be listed in a covering letter.

AK ADVERTISING

### COMPUTER PATENT ANNUITIES

JERSEY

A professional firm engaged in the renewal of patents and Trade Marks throughout the world need a

## MANAGING PROGRAMMER

to undertake a two year appointment in this low tax area in order to structure our small programming team.

The successful applicant will have proven experience in managing staff, devising and implementing standards and procedures, and leading project teams — probably in a tightly organized, medium sized site — and will be required to work closely with our Chief Programmer.

CPA have an NCR V8555M mainframe, and ideally, though not necessarily, candidates will be experienced on NCR computers: knowledge of on-line systems will be useful, and of COBOL essential.

Please write, giving full details of age, marital status, education, experience and current salary to Ian Thomas, Computer Patent Annuities, Union House, Union Street, St. Helier, Jersey, C.I.

## EXPAND YOUR EXPERIENCE

A large Pharmaceutical Company situated in West London is currently enlarging its D.P. Department to handle a major expansion of Development and the installation of a new IBM 4341 in October.

Current Software Systems in use are DL/I, CICS, Power/VS, which will be run under VSE on the IBM 4341. The following staff are required to contribute their ability in organising the new machine.

### DATA CONTROL SUPERVISOR c. £6200

You would be responsible for the data control area, which entails the reorganisation of J.C.L. from card to disc, liaison with users, Man-Management of the data control staff, documentation, distribution, job set-up, etc. Knowledge of DOB J.C.L. is essential. Salary will be circa £6200 and other fringe benefits are also available.

### OPERATOR DOS/POWER/VS £5500

Every operator's job sounds the same when you read an advert and we are not saying this is different, but what we do say is that the rewards and the environment are much better. For example, you work two shifts: 7 a.m.-3 p.m. and 2 p.m.-10 p.m. The salary is £5500 per annum and on top of this there are FREE MEALS on all shifts, BUPA after one year, permanent health scheme, FREE life assurance and purchase of goods from the company at a DISCOUNT.

If you think you would be interested, ring NEIL ARMSTRONG on 01-603 7335 NOW!

REF: NACW2

Information Processing People  
80 Parkway Road, London, W.9. Tel: 01-603 7335  
Computer Services & Recruitment Consultants

JBA

## IMS Systems Generation

Munich area

salaries £20,000 +

Opportunities exist in the Munich area for Systems Programmers with a solid grounding in IBM 370 software, plus experience of the generation, installation and tuning of IMS d/b software.

Excellent salaries, paid tax-free, plus good relocation and settling in help. Note that similar opportunities exist in both Holland and Saudi Arabia, for candidates preferring these areas.

Contact: Andy Wright

## Codasy Database Design

Holland

c. £18,000 + car

Superb opening for a Database Designer, especially with good experience of DMS 90 or 1100, to join one of the fastest growing specialist consultancies in Holland. Initial project likely to be a DMS 1100 design job, but other types of db/dc design will follow. (TOTAL, IMS, IDMS etc.)

Permanent career position with a true consultancy — excellent salary and benefits.

Contact: Andy Wright

## Senior Analyst/Programmer

City

c. £10K + benefits

Our clients are the U.K. subsidiary of one of the major Reinsurance groups in Europe. Having recently installed an IBM System 34, they need an experienced Analyst/Programmer to work with the DPM in implementing the first major system, which will include on-line data entry and enquiry facilities. Further developments and enhancements are also planned, which will entail increasing responsibility for the successful candidate. Knowledge of reinsurance would be useful but is not essential. However, good RPG2 experience on System 34 or System 3 is required.

An exceptional range of fringe benefits is offered, in addition to a very attractive starting salary.

Contact: Bernard Kiernan

## Systems Analysts

Nottingham

c. £6,300

A major and diverse company requires SYSTEMS ANALYSTS to assist in the development of a range of interesting commercial applications. In addition to systems experience applicants should have a good education and at least 2 years programming experience preferably in an IBM mainframe environment.

Contact: Bev Stevens

## APL Programmers

West of England

up to £7,000

Our client, an international computer services organisation, has vacancies for APL Programmers to work on the development of commercial systems on micros. Candidates should have two years APL experience, preferably in an accounting/financial environment and the ability to handle client problems.

Above average salaries and benefits.

Contact: Jim Baker

## Head of Tech. Publications

Bedfordshire

c. £9,000

We have been retained to recruit a Senior Technical Publications person to run and control a group of up to 20 staff. The Company are a computer manufacturer producing and selling quality products to all Sectors of Commerce, Industry, scientific and military areas.

Candidates must be very experienced in either hardware or software with a sound familiarity of total systems. A high degree of management ability is also sought.

Contact: Mike Creamer

## Analyst/Programmer

Croydon

c. £7,000

Our client, a large international organisation, has immediate vacancies for Analyst/Programmers to join the commercial development teams. Applicants should have at least three years ANS COBOL programming experience on IBM equipment and have had some involvement with systems design, preferably in accounting, general commercial or database applications.

This is an exciting opportunity to work on new IBM hardware with above average fringe benefits.

Contact: Jim Baker

## Graduate Programmer

City

neg. to £6,500

FINTEL, a joint venture of the Financial Times and Eitel, are the leading providers of information to the PRESTEL system. They are now developing information channels into a world-wide on-line network using a PDP 11/03 linked to an IBM 370/148, PRESTEL and other host systems. They need a young graduate with about two years or more computing experience and a working knowledge of MACRO II. Training in MicroCOBOL will be provided.

The selected candidate will be the programming specialist in a multi-disciplinary team, so good communicative skills are essential.

Contact: Bernard Kiernan

## JAMES BAKER ASSOCIATES

International Personnel Consultants

32 Savile Row, London W1

Tel: 01-439 9311



## Computer Engineers

£Neg + Car Nationwide

Due to expansion our client, a major computer company manufacturing medium to large computer systems, is now seeking a number of experienced computer engineers to maintain their equipment on customer sites.

The ideal candidates will already have at least one years experience on MINI or MAINFRAME computers and some practical knowledge of associated peripherals i.e. disk drives, V.D.U's and printers.

A salary of up to £7000 (commensurate with experience) and C.A.R. will be offered to the successful candidates.

If you wish to find out more details about these positions telephone or write to Alan Slater quoting reference AS 3030.

**Lloyd Chapman Associates**

123, New Road Street, London W1V 1HT 01-408 1570

## Hoggett Bowers

Executive Selection Consultants

### Group Systems Manager

Thames Valley, c.£11,000+ bonus+car

This Group is a European market leader with a turnover in excess of £40 million, and is currently undergoing a substantial reorganisation to improve profitability. It has several operating companies in the UK with a number of computer installations. The Group Systems Manager will be responsible for the co-ordination of data processing systems throughout the Group including the development and implementation of long term strategies, recruitment of senior staff and hardware selection. The successful applicant will be required to exert a strong personal influence over the individual DP departments and to ensure that the highest professional standards are achieved. Candidates aged 30-38 and educated to at least degree level must show outstanding systems and DP experience gained in a variety of environments. Good communication skills and commercial understanding are essential. Very generous benefits include relocation aid to this pleasant rural area.

G.E. Forester, Ref: 18255/CW. Male or female candidates should telephone in confidence for a Personal History Form to: LONDON: 01-734 6852, Sutherland House, 56 Argyl Street, W1E 6EZ.

Unequalled in its range of job opportunities

## A new Challenge for the 1980's

In order that our Management Services Department can meet the increasing demands of company activities in the commercial, production, and engineering areas, we require additional staff. The department currently operates a dual IBM 370/158 installation, with about 150 on-line terminals supported by IMS DB/DC and it is expected that this figure will rise to 350 during the next 5 years. To meet this increased requirement we need:-

### Systems Analysts

with a background of at least 2 years experience in commercial systems, including on-line and/or business experience in an industrial environment at managerial level, capable of developing data processing techniques.

### Trainee Analysts

Ideally with a degree or HNC/D in a business or engineering area, who can look forward to good, career development incorporating a variety of interesting projects.

### Programmers

with at least 2 years experience, preferably including on-line, who will be working within the application programming section on a variety of batch and on-line systems.

### Trainee Programmers

who have attained the minimum qualification of a G.C.E. 'A' level, preferably maths, and/or some D.P. experience.

For all these positions we can offer competitive salaries, attractive conditions of employment, and relocation allowances where applicable. If you are interested you can obtain more details by telephone, or you can write, with particulars of your experience and qualifications to:- Mr. D. Baines, Ref COB3A, British Aerospace Dynamics Group Personnel Department, P.O. Box 19, Six Hills Way, Stevenage, Herts. SG1 2DA. Telephone Stevenage (0438) 2422 Ext 3280

**BRITISH AEROSPACE**  
DYNAMICS GROUP At Stevenage

### SENIOR ANALYST PROGRAMMER

A Senior Analyst/Programmer is required to act as supervisor of computer services in the Computer Unit. The Unit has a small PDP-11 computer connected to the London University computer network. The appointment entails the provision of an advisory service, the supervision of computer operations, and the presentation of reports to the University. Salary on Scale 1A of £6,000 per annum plus £1,400 London weighting. For further details, contact: Mr. J. H. Smith, Personnel Officer, British Aerospace Dynamics Group, Six Hills Way, Stevenage, Herts. SG1 2DA. Tel: 0438 2422 Ext 3280.

### CLASSIFIED COPY

All classified copy should reach our offices no later than 3.30 p.m. on the Monday preceding Thursday's publication.

If complete artwork is supplied, 11 a.m. on a Tuesday.

Ring Ray Kelly for further details on 01-261 8016.



Instron is one of the most successful and advanced manufacturers of materials testing equipment in the world. Our products are widely used in research, development and quality control and have won many awards, including Queen's Awards for Export and Technological Achievement.

## Real Time/Software Professionals

£5,000-£8,000

Do you seek the responsibility and excitement of working with a small team of hardworking professionals on creative and demanding projects?

We require staff for software design and programming to take software responsibility within multi-discipline teams engaged on a wide range of projects, involving mini computers and micro-processors.

We are in the technological forefront in applying mini computers and microprocessors to our materials testing instrumentation business. The opportunities in our world-wide market are so enormous that we can give you as much opportunity and responsibility as you can handle.

You will need a technical/science degree and at least 2 years' experience of high level scientific and low level languages. If you have worked on original operating systems, so much the better.

If you have the experience we need and value your future, then you and Instron have a mutual interest.

In keeping with the high standards we maintain, the company is able to offer excellent starting salaries with four weeks' holiday p.a. and appropriate fringe benefits, which include a non-contributory pension and life assurance scheme. Reasonable relocation expenses will be paid as appropriate.

Please ring the Personnel Department, High Wycombe (0494) 33333 or write to the Personnel Manager, Instron Ltd., Coronation Road, High Wycombe, Bucks.

Men or women may apply

Precision Engineering - Electronics & Mechanical  
Queens Awards for Export and Technological Achievement

Birmingham

C&L

to £10,000

## OPERATIONS MANAGER

**The Client** Part of a major U.K. quoted group with world-wide interests. A leader in its sector of the industrial chemical market, with a consistent profit record.

**The Job** A new post, resulting from a decision to establish an IBM 4300 based computer centre to provide on-line computing facilities to a number of factory and depot locations in the U.K. Reporting to the Management Services Manager and supported by a small staff, the immediate task will be to install the new equipment and develop new operating procedures.

**The Candidate** A man or woman aged 30-45, with significant data processing experience. Essential personal qualities are good organisation and communication skills and the ability to control and motivate staff.

Assistance will be provided with relocation expenses.

Résumés, which will be acknowledged and forwarded to our client unless a covering letter gives contrary instructions, to E. H. Simpson, Executive Selection Division, Ref. 8835 at the address below.

COOPERS & LYBRAND ASSOCIATES LTD.

Management Consultants

Shelley House, Noble Street, London, EC2V 7DQ.

## ADVANCED TECHNOLOGY SOFTWARE

NW Surrey £4,900-£9,300 p.a.

Due to continued expansion, our client needs to recruit additional staff to work on military real time software systems.

Ideally we are seeking people with experience of CORAL, RTL-2 and/or Assembler - in particular PDP-11 operating systems. However, we would also like to hear from those in the commercial world who feel the

need for a greater technical challenge in their work.

The Company operates a sensible career structure. Where applicable, generous relocation expenses will be paid.

Why not discuss the opportunities with me? Initially, get in touch with my office with your address/telephone number. Alternatively, telephone me, any evening, on Burgess Hill 41360.

David Paskins  
Peter Dye Associates  
Management Consultants  
Downsview 15, Little London, Heathfield, East Sussex TN21 0BB  
Telephone: Horam Road (04353) 2133

## Bureau-Commercial

Don't be caught in the big squeeze in 1980 - consolidate your career with the right move now! Our Clients, a major force in the field of on-line computer services, both in the UK and EEC can offer you the stability of a large, well-organised and soundly financed company, together with the variety, stimulation and individual responsibility found working in small project teams. Current requirements are for a young, enthusiastic Analyst with sales orientation and two COBOL programmers to join the business applications group. Applicants for the Analyst position should have a sound commercial DP background plus good analytical and communication skills for this Sales/Client Support role. Programmers should offer at

least 2 years COBOL experience, have a lively outgoing personality, and the ability to cope when the pressure is really on. Rewards are high: in addition to job satisfaction you will receive an excellent salary plus profit-sharing and incentive bonuses. Matrix will be conducting preliminary interviews during January, after which shortlisted candidates will meet the Company's senior personnel.

**Programmers £6-7.5K**  
**Analysts £7.8-10K**

### EEC

Analysts and Programmers - do you enjoy overseas travel and customer liaison? If you have more than 2 years experience in PL/1, BASIC, RPG, COBOL or Assembler (on minis or mainframes) our Clients, a leading London-based Software House, can offer you the variety and responsibility you have been seeking.

to £9.5K

### Reading

The opportunity to live in a rural location while enjoying a London salary! Senior Analysts and Designers are sought by the Commercial and Industrial Systems Groups of a major Software House. Several years experience in the implementation of computer systems plus analysis or design of one major system (either commercial or industrial/basic software) should be offered.

£8.5K + bonus

## Mini+Micro Software

Challenging opportunities in Holland

This highly regarded Systems Consultancy Group is, in its areas of specialisation, the acknowledged market leader in Holland. If you consider yourself ready for a career step that will probably give you ample technical & promotional potential to take you through the 80's then this is your next move. Openings exist at various levels of seniority in the areas of: Mini & Micro Systems, Communications, Message Switching, Process Control, Real-Time Banking and Distributed processing. 2-6 years Assembler background is essential and a degree in a numerate subject is desirable. You will be working in a technically professional environment offering both independence and complete responsibility for defining and executing demanding projects. You will be based in one of Holland's principal cities where superior housing is readily available and recreational/educational facilities plentiful. You will be close to Germany, France and Belgium not to mention England just 45 minutes away. In addition to a significant salary reflecting local conditions and full removal expenses you will also receive: Initial accommodation allowance, Assistance with house purchase, 4 weeks holiday + 8% bonus, Settling-in allowance, Medical insurance and Pension scheme.

Salaries in the range £11-16K

## Process Control Herts

A major British Instrumentation and Control Group, based in Hertfordshire, requires Software Specialists, Designers and Programmers with real-time mini and micro experience for the development of advanced new products. The Company continues to expand rapidly and has enormous growth potential, which will be fulfilled by employing the right technical specialists now. You should have a sound appreciation of the planning, design and implementation of standard software, specialist knowledge in the fields of compilers, operating systems, communications, and industrial applications will be highly rewarded. Software Specialists will be given the opportunity to design major products and packages. Project Leadership will be available to those offering supervisory as well as technical experience. Conditions of employment are excellent, benefits include a free life assurance scheme, contributory pension scheme and subsidised lunches. Relocation assistance where necessary.

£7-9.5K

### Consultancy

London office of International Information Sciences Company seeks additional consultants for a general consultancy/marketing Support role. 6+ years experience required, preferably with knowledge of Government or Defence Systems. to £10.5K

### CDC to £8K

Systems Programmer with CDC background required for KRONOS to MOS conversion by major London Bureau: applicants must have OS and compiler experience.

### PL/1 to £7.5K+ mortgage

This N. London-based financial institution urgently seeks a Senior PL/1 Programmer to complement its development team. Outstanding benefits offered.

**MATRIX**

10 Grenville Place  
London SW7 4RW  
01 373 3063



# Major NEW Installation

Our client is one of the UK's most successful exporters and is growing at a very rapid rate and, to assist the dynamic management in the control of this success, the company is to instal an IBM 4331 configuration in mid-1980. The Director of Computing reports directly to the Chairman which is an indication of the significance attached to data processing in this company.

To assist with the development of major systems three key managers are sought. Reporting to the Director they will play key roles in the development of a wide range of systems which will all be on-line and database orientated. Initial development effort will be concentrated in the area of on-line COPICS and on-line purchasing systems.

## SYSTEMS DEVELOPMENT MANAGER

This position will carry responsibility for all aspects of systems development and will involve controlling a small team of analysts and programmers. Candidates must have extensive experience developing and implementing systems covering manufacturing, distribution and stock control. Experience of on-line systems and database essential and previous experience using IBM hardware and software a decided advantage. (Ref. CW/8002)

## OPERATIONS MANAGER

This manager will assume total responsibility for computer operations which will include the provision of a major on-line service. Candidates will have many years experience in computer operations and teleprocessing and it is most likely that the successful candidate is already an operations manager. Extensive practical knowledge of IBM 370 hardware and DOS/VS software is important and experience in establishing a new department in a 'green-field' situation would be advantageous. (Ref. CW/8003)

## SOFTWARE SPECIALIST

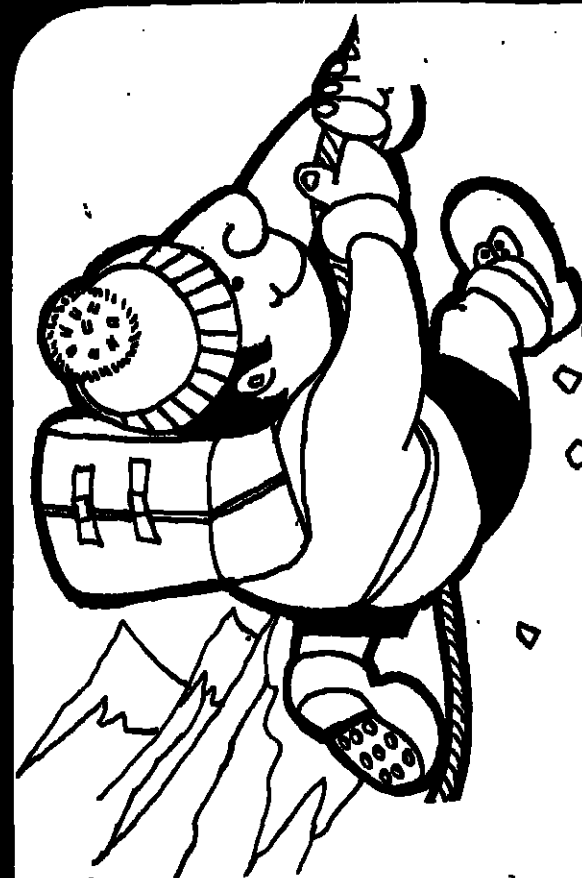
The successful applicant will be a top class specialist responsible for ensuring the most effective use of all available software in this new installation. This is a key position and to be considered candidates must have extensive experience in systems programming in an IBM environment. Specific software knowledge will include DOS/VS (E), CICS/VS and DL/I at a detailed level. (Ref. CW/8004)

**SALARY RANGE £9000-£12000+CAR**

Salaries for these appointments will be negotiated in the range shown above and the other benefits, which include a company car and relocation expenses, will more than adequately reflect the importance our client attaches to these positions. Interested candidates should contact Ivor Norton in the strictest confidence quoting the appropriate reference.

Ivor Norton Management Services Ltd

62 Shaftesbury Avenue, London W1V 7DE. 01 734 8867 P.O. Box 53 Copthall Tower House, Harrington HG1 1TS. Tel: Harrington 86828 24 hour answering service (0423) 5131



# Reaching for the top with a KPSIL CONTRACT

### PROGRAMMERS

IBM 370/OS/IMS/COBOL 'COPICS' essential. Stock control. Midlands location. Immediate start. c£260

### SENIOR PROGRAMMER

For database team. IBM PL1/COBOL. DL1 experience essential. Midlands location. Immediate start. c£260

### SINGLE SYSTEM 10 PERSONNEL ASSEMBLER

Various applications. N.W. and Midlands locations. Long and short term contracts. Immediate start. c£260

### SYSTEMS DESIGNERS AND ANALYST/PROGRAMMERS

ICL 1500. CDE/VTL/ASSEMBLER. Various locations. Long and short term contracts. Immediate start. c£260

### TECHNICAL ANALYST

HP3000/COBOL/IMAGE desirable. Midlands location. Commercial applications. Immediate start. c£275

### COBOL PROGRAMMERS

IDS/TDS experience desirable Commercial applications. Midlands location. Immediate start. c£260

### IBM 370 COBOL/DOS PROGRAMMERS

Command level CICS preferable. Commercial applications. Varied locations. 6 month contract. Immediate start. c£270

### ICL 2900 IDMS/COBOL

High level SYSTEMS DESIGNER required for our Northern-based client. Immediate start. c£260

### PROGRAMMER/ANALYST

ICL 2900/VMIB/COBOL. Structured programming. North-West location. 6 month + contract. Immediate start. c£250

Required by our Northern-based client. Commercial applications. 3 months contract. Immediate start. c£250

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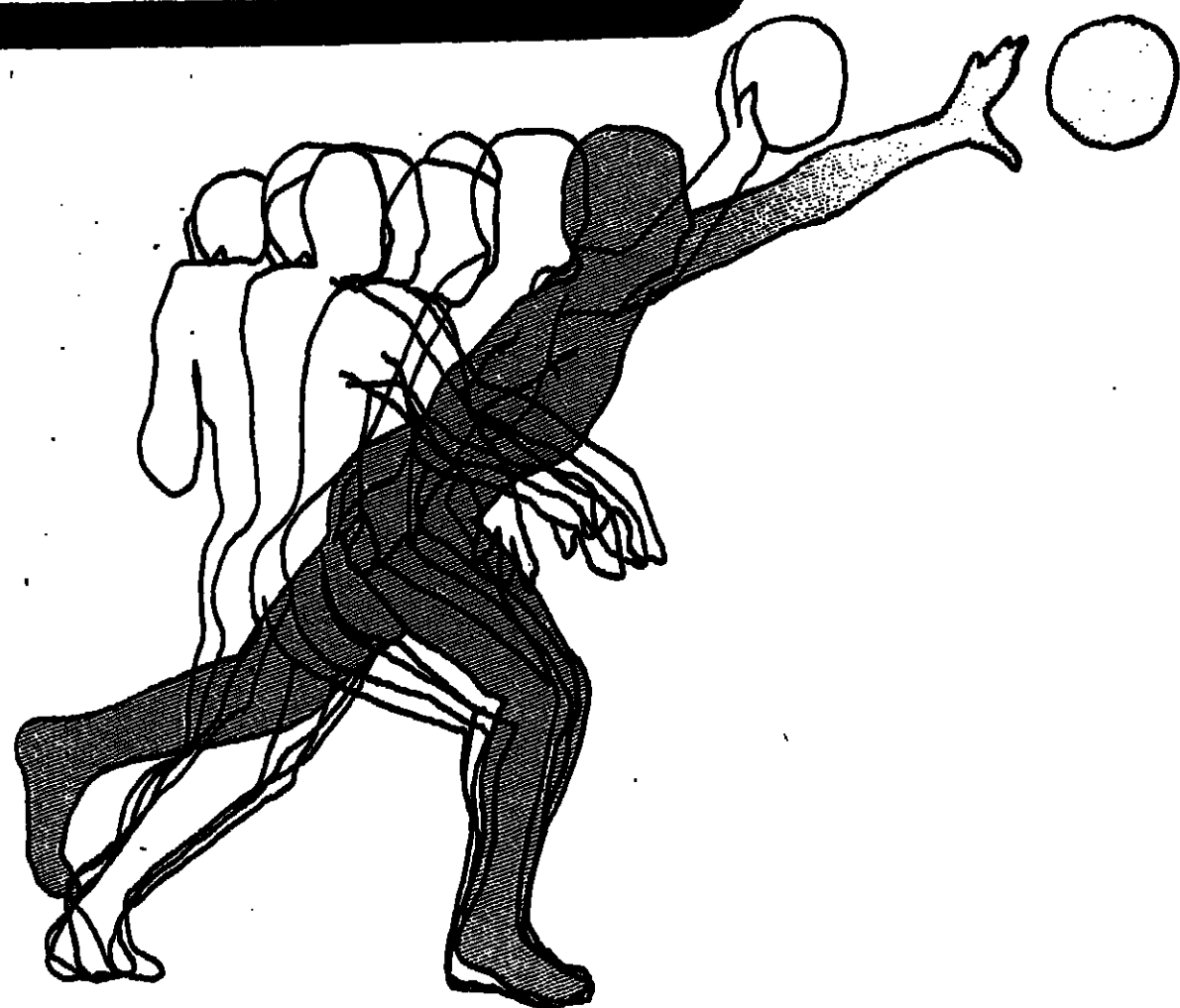
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Computer  
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# MANAGEMENT & EXECUTIVE SELECTION

telephone 01-637 9611



## Let yourself be drawn into the world of interactive graphic systems

An exceptional opportunity has arisen for computer service engineers in

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Our client is already a leading name in the computer industry and is now looking for experienced engineers to spearhead the rise of their rapidly expanding interactive computer graphics division. This rare opportunity to join a new division in the early stages of its growth affords excellent prospects for future advancement.

Working from home initially you will be part of a small team maintaining interactive graphic systems comprising a minicomputer with the usual computer peripherals and graphic terminals. A good basic training in electronic engineering is essential and previous experience of graphic systems and V77 hardware and software is desirable. However, in-depth training will be given.

A salary scale of £8K to £8K p.a. is offered and a company car is provided. In addition there are big company benefits and rapid career progression within a dynamic environment.

Take up this opportunity by contacting Peter Gorton, Manager Computer Engineering Division.

Suite 201/6 Albany House 324 Regent Street London W1R 5AA 01-637-9611

MANAGEMENT & EXECUTIVE SELECTION

JBA

## SOFTWARE DEVELOPMENT ON MINI-COMPUTERS

Thames Valley - near Windsor

£6,500-£11,000

### The Company

Our client is a very well established American computer manufacturer, providing modern systems to a variety of business, engineering and scientific organisations internationally. Near Windsor, the Company has its U.K. and European headquarters where development of Systems software and applications packages for world-wide use is undertaken.

The successful release recently of new hardware and software and the increasing demand for the Company's products necessitate further expansion of the dedicated development teams in several technical areas. The Company's success and its salary policy ensure that the work is always challenging and salaries are always among the best offered. If you have what it takes, salary is unlikely to be an obstacle.

### Compiler Designers

The Company's emphasis on easy to use systems has many implications for the design of its compilers for the 1980's. Applicants must have some practical knowledge of compiler design, having developed or supported a compiler in the field. If you know that you can design the best compiler, now is your chance to show your ability to apply innovative and creative techniques.

### Systems Programmers

The Company's products have features that greatly benefit Systems Programmers - but only a Systems Programmer knows what Systems Programmers need. Opportunities exist to make the transition from supporting manufacturer's system software to actually developing it. Products include data management, on-line transaction processing and general software packages.

Contact: Mike Creamer

JAMES BAKER ASSOCIATES, International Personnel Consultants, 32 Savile Row, London W1. Tel: 01-439 9311.

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Building on ten years of success, our requirements for top class Operations Staff are continuously expanding throughout the UK and abroad. We have immediate requirements for staff with:

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ICL Dataskil  
The Computer Professionals

CAP Scientific is expanding rapidly and we have produced over £½ million of business in our first six months of operation.

## SCIENTIFIC REAL-TIME SYSTEMS

We are looking for programmers and designers who are interested in real-time systems with a distinctly scientific flavour. Our work ranges from dedicated micro-systems to large networks of mini-computers. Most software is written in CORAL 66 and MASCOT is used on an increasing number of projects. We have a number of positions to be filled in our team of consultants and we are specifically looking for skills in:

Interprocessor communications

Design of micro systems Design of displays  
Analogue I/O and signal processing

Salaries range from £6,000 to £12,000 and include a profit related bonus. CAP Scientific is a systems consultancy and staff have an opportunity to work on a variety of projects.

We have a formal career development programme to ensure that proper attention is given to your career interests and plans for future assignments leading to promotion. Salary and promotion reviews take place every six months. We have a good benefit package including at least four weeks holiday, a good sick pay scheme, staff mortgage service and a share purchase scheme. Removal assistance will be given where appropriate. We will arrange local interviews where possible.

This could be your opportunity to join us and help build a successful venture. If you would like to apply, please complete the coupon below of telephone, quoting reference number CW19140.

Tony Knott, Recruitment Manager  
Computer Analysts and Programmers (UK) Ltd.,  
20-26 Lamb's Conduit Street, London WC1N 3LF  
Tel. N4: 01-242 0021

Name  
Address

Daytime phone no.



**MYRIAD****D.P. PROFESSIONALS****N.W. LONDON. £6500-£7000**

A major manufacturing and retailing organisation with outlets throughout the U.K. and Europe is seeking to strengthen its Data Processing team by recruiting three professionals to assist in the development of Work in Progress and warehousing systems.

Development will centre around an IBM System 3 Model 15 and will incorporate the use of microprocessors, data capture terminals, light pen readers and other sophisticated equipment.

Candidates will be able to gain considerable experience of batch and on-line applications and to develop their own individual skills in design, implementation and user liaison.

The three key members sought are:

**ANALYST/PROGRAMMER** c £7000  
with 3 years' D.P. experience offering a sound knowledge of RPG II and CCP.

**PROGRAMMER** c £6500  
with a minimum 18 months' RPG II experience together with a good understanding of CCP.

**O & M ANALYST/IMPLEMENTATION ANALYST** c £6500  
with 1-2 years' implementation experience together with procedural writing and forms design. The Institute of Management Services qualification is also desirable.

A good range of company benefits contribute to make these excellent opportunities for progression to the career-minded professional.

Ref. N4/1701 CW

**MYRIAD APPOINTMENTS LIMITED**  
30 Fleet St London EC4Y 1AA Tel 01-353 0981 24 hrs

**Telephone Communications**

**Sales Opportunities - £8.5K-£10.5K  
+ Car**

A highly successful, totally British company is expanding as a result of increasing demand for its computerised telephone business systems and communications products. The success is based upon a positive approach to the market supported by effective technical development that provides an extremely flexible product range using the latest microprocessors.

The expansion has created the need to appoint Salesmen for the Midlands/South West, South of the Thames, the North East and Scotland. The interest in and demand for the advanced products is high and requires a very energetic and intelligent approach to capitalise on the area potential.

These positions provide excellent opportunities for people with a sales background in telecommunications and/or computing. Alternatively, candidates will be considered without selling experience but who are self-starters and have a good business acumen with a background knowledge of the industry. This dynamic group with its own production facilities is poised for considerable expansion and offers an extremely friendly environment for the right individuals.

We want to discuss these opportunities immediately. Please quote CW103-DJ.

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**SO YOU THINK YOU COULD SELL?**

We are the leading independent COM Bureau in the U.K.

To cope with expansion we need an additional person for our Sales staff - to be based at Watford.

If you have related experience - either in computing or micrographics - and feel capable of presenting the benefits of COM to prospective users, then this could be one of those rare opportunities to break into Sales.

We can offer a well-paid career in a stimulating environment. The remuneration package includes a high basic salary, commission scheme, and a company car.

You should offer enthusiasm, drive and the determination to succeed! Interested?

Ring Bill Corbally on Watford 41387, or write for an application form to:

**microgen LIMITED** 9 Langley Road  
Watford  
Herts. WD1 3PS

**International EDP Auditor**

We are seeking:-

- an EDP Professional with basic accounting knowledge to join our EDP Auditing Group on assignments that cover all EDP aspects of Mobil's worldwide petroleum and chemical operations.

The work involves:-

- review of Systems and Data Processing installations, appraisal of internal controls and operating procedures of computer systems, discussion of findings and recommendations with Senior Management, culminating in submission of reports which must be clear and concise. Other duties include advising non-EDP auditors on implementation of computer audit and retrieval programmes. High standards of performance are expected and the ability to communicate effectively at all management levels is essential.

Candidate (male or female) must be:-

- preferably aged 25-35 with at least six years' experience with large-scale computer equipment and mini-computers; experienced in systems analysis, programming, project management and computer operations; preferably holding university degree. Although a professional accounting qualification is not essential, some experience and training in accounting is necessary.

- single or married without children.

The assignments would be:-

- particularly attractive because of the extensive worldwide travel involved.  
- almost exclusively outside the UK, entailing continuous living abroad and travelling between locations.  
- more competently completed with a knowledge of French, German or Spanish.  
- most helpful in providing the incumbent with management EDP auditing experience for further career progression in EDP or financial management with this worldwide, fully integrated oil company either in the UK or abroad.

We offer:-

- attractive salary package (which includes tax-free overseas premium) plus full accommodation and living expenses (including spouse), life assurance, pension and dependants benefit scheme, home leave.

Please write to C. T. Spalding giving details of qualifications, experience, age and current salary to:-

**Mobil Services Company Limited,  
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54/60 Victoria Street,  
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**Mobil Services Company Limited**

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THE FRASER WILLIAMS GROUP. Our name is well-known and respected in all areas of commerce, industry, government and science. In 10 years we have become one of today's leading UK computer consultants, with over 200 permanent staff and a growing network extending into North America with offices in Toronto and New Jersey. Our success is based on two key strengths: skilled, adaptable, ambitious and commercially aware people; and an organisational structure which creates a red-tape free environment in all our virtually autonomous offices. Our clients include major UK and international companies for whom we provide a wide range of services and specialist skills - from programming to complete turnkey projects, with both bespoke and package implementation on mini, micro and mainframe equipment. To the dedicated professional we offer variety, exceptionally good experience, training and genuine career development, with an earnings package of up to £11,000. PROGRAMMERS, ANALYSTS, CONSULTANTS AND PROJECT MANAGERS - with sound experience of any application, equipment or language - contact your preferred location now on the telephone number shown. Or write to Fraser Williams & Co, Port of Liverpool Building, Pier Head, Liverpool L3 1BY.



## FINE ART AUCTIONEERS BURROUGHS PROGRAMMER

LONDON, W1 £5,500 + BONUS

Our Client is the foremost firm of Fine Art Auctioneers in the world with sales of £185M. The 20-strong Computer Department has recently upgraded its Burroughs hardware from a B2700 to a B3700, which supports on-line TD B30s and B80s. The Department is also developing stand alone CMS systems on B80s.

The continued growth and increasing sophistication of the business has created the need for further systems development and the appointment of an additional programmer is crucial to the success of these plans.

You will join a busy department developing interesting applications and will gain useful database and real-time processing experience.

You must have around two years' practical experience of COBOL gained on Burroughs equipment and preferably, you will have a good academic background and a confident outgoing personality, together with enthusiasm and career ambition.

For further information, please contact MARK IRENS, quoting reference CW/1701.

HUTTON EXECUTIVE SELECTION LTD.  
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HUTTON STREET, LONDON EC4Y 8HR

TELEPHONE: 01-353 7141 (24 HOURS)

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the growth industry of the 80's

Up to £20,000 + benefits (no commission)

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We currently have 13 operating companies providing services to all sectors of industry and commerce, Government and professional institutions within the UK and on the Continent. By the mid 80's CMG expects a turnover in excess of £100 million.

We are looking for experienced Sales Consultants to sell the Company's standard computer systems. There are various methods of operating these systems which can involve the use of some computer equipment in the customers office. The systems include payroll, financial accounting and invoicing. They are well proven, tried and tested services. You should have a good track record in sales, preferably in the computer field although this is not essential, together with an accounting or commercial background.

Salary is reviewed annually on the basis of sales made and is not linked to a commission structure. Unrivalled benefits include:

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- ☐ Free medical insurance ☐ Free life insurance
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We currently have vacancies in:  
Croydon, Greenford and the City of London.

### Informal Interviews

Find out what makes CMG so special. Ring 01-681 7631 for an appointment or come along anytime between 10a.m.-5p.m. on Wednesday, 23rd January.

The Dickens Room, The Inter-Continental Hotel,  
Hyde Park, London W1.

If you are unable to make it then, please phone or write for an application form, quoting ref UK201CMV to:

Bobbie Rogers, CMG (UK) Ltd.,  
Surrey House, Bedford Park,  
Croydon, Surrey CR9 2AP.  
Tel. 01-681 7631.

CMG

CMG

Analysts/Programmers

# Keep yourself well oiled

Energy and computers are two of the most talked about issues at the moment. Here is your chance to put them together at Amoco and get paid up to £10,000 for doing so.

The vacancies are for Commercial and Technical Analyst/Programmers to work in London for Amoco Europe, the European affiliate of Standard Oil Company of Indiana, a major international oil company. The London Data Centre comprises an IBM 3031 computer, operating under W/VS/CMS with teleprocessing links to affiliated offices throughout the UK and Europe. In addition, we will install a Perkin-Elmer 3 megabyte 3244 computer in 1980 to handle seismic and geological work with interactive graphics terminals.

A large capital investment programme is underway which includes both North Sea development projects and the installation of a catalytic cracker at our Milford Haven refinery. The resulting increase in sales and our North Sea exploration and production activities have caused additional demands on our Information Services Department which is undergoing a major expansion to service these requirements. New systems are to be developed using the latest computer techniques such as Database and Interactive Computing.

### BUSINESS SYSTEMS

The work covers a wide range of activities, including financial, marketing and administration systems for our European affiliate companies. We have several vacancies for Analyst/Programmers, ideally graduates with experience of IBM mainframe, COBOL and MARK IV. With the proposed introduction of Database, IMS experience would be an added advantage.

### TECHNICAL SYSTEMS

Due to expansion, there are several vacancies for Analyst/Programmers to work within our Technical Systems group, working on exploration, production and refining applications. Applicants should have a technical degree and several years FORTRAN experience. Any previous Oil Company or Min Computer experience would be an advantage.

Salaries will be from £6,500 to £9,500 per annum and, in addition, we offer a range of benefits including £624 per annum London Allowance, £1 per day luncheon vouchers, contributory pension scheme and interest free season ticket loan.

Please write to Brian McIntock at the address below supplying curriculum vitae, or telephone or send the coupon for more details and an application form.

Post to:  
Mr Brian McIntock,  
Employee Relations,  
Amoco Europe Inc.,  
33 Cavendish Square, London, W1.  
01-408 1555.

Please send me an application form for the \_\_\_\_\_ vacancy

Name \_\_\_\_\_

Address \_\_\_\_\_

Phone no. \_\_\_\_\_



## Development Programmers Extend our lead in Computer Aided Design

Racal-Redac Limited pioneered the development of computer aided design. To-day we are renowned worldwide for our interactive graphic PCB layout system which combines a DEC, PDP 11/34 with our sophisticated software to produce a technologically advanced and 'easy to use' system.

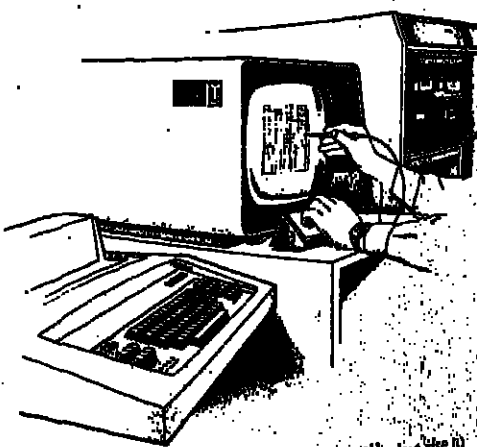
Our success has resulted from our total commitment to advanced development, a commitment that has constantly kept us ahead of our competitors in the CAD electronic design field.

We intend to maintain our lead and are currently developing a range of 'new generation' design systems for a variety of applications and we are confident that we will extend our lead into mechanical design, integrated circuit layout and circuit analysis.

Our future development programme is ambitious and we have vacancies for Programmers at all levels to work in small teams on 'state of the art' development projects.

Applicants (male/female) will hold a relevant degree or HND and will currently be involved in developing user orientated systems preferably using Fortran or other scientific languages.

Redac have recently opened a custom built development laboratory, with excellent facilities and computers used solely for development purposes.



Future expansion at Redac will give rise to excellent promotion prospects and these positions represent an ideal opportunity to become established in one of the most beautiful areas in England.

Please apply with details of age, qualifications and experience to:

Brian Ashcroft  
Personnel Officer  
Racal — Redac Limited  
Newtown  
Tewkesbury, Glos. GL20 8HE  
Telephone (0684) 294161

Britain's fastest growing electronics group

RACAL

## Multi-Processor Systems

London Based

Salaries  
£7-10K +

### — opportunity

The leading Information Services company with 20 years worldwide success behind it is expanding its U.K. project-base in such fields as system technology, communications and applications software and is now seeking systems and software professionals with large mainframe (particularly ICL 2900) or Real-Time mind experience.

### — applications

Considerable importance will be placed on any expertise in the fields of: inter-computer networks — command and control systems — on-line transaction processing — VDU screen formatting — on-line computer graphics in either a programming, analysis or systems design role.

### — benefits

Successful applicants will be based in either Central or North West London with possible opportunities in Belgium and Germany. You can certainly expect to demand a substantial salary in addition to a range of top fringe benefits including: interest-free season ticket loans, luncheon vouchers, free BUPA, pension and car schemes, etc.

### — environment

You will play an important role in future developments within the autonomous U.K. group which is one of the most dynamic divisions of this organisation which employs 13,000 professionals in 100 offices across 5 continents.

### — interviews

Interviews will be held at our client's Central London headquarters and firm offers will be made within 10 days. Please send your C.V. in the first instance to MATRIX who are retained to co-ordinate this recruitment programme.

A challenge for discerning professionals

01-373 3063



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Matrix



## MYRIAD COULD YOU BE A RECRUITMENT CONSULTANT?

**LONDON £7500-£12000**

If you are interested in recruitment but do not have the necessary experience Myriad may be able to give you the opportunity to train as a Recruitment Consultant.

As one of the major companies in our field with a well-established professional reputation, we have both the resources and expertise to train you in the skills needed to carry out this challenging and rewarding work.

You must have a background in the computer industry, such as programming, analysis or any sales oriented position. Without this essential grounding you could not be expected to give career advice to applicants or advise clients in major recruitment assignments. Under 35 you should possess the potential to succeed in highly sales oriented situations in which you will have the freedom to work very much on your own initiative.

The wide range of activities encompassed by the work will undoubtedly surprise you. You will also be interested in your training and career development. To find out the answers and much more about the varied and interesting life as a recruitment consultant, contact us to arrange an informal discussion and we will also tell you about the outstanding long-term career opportunities available.

Ref. AW 1/1701

**MYRIAD APPOINTMENTS LIMITED**  
30 Fleet Street London EC4Y 1AA  
01-353 0981 (24 HOURS)

### DATA INTERPRETER/ COMPUTER OPERATOR

Up to £4,888

The British Gas On Line Inspection Centre has achieved an international reputation for the development of improved methods for inspecting high pressure pipelines. Due to expansion of our service we have recently moved to a purpose-built site at Crumlington, Northumberland.

Computer analysis of the inspection data is a key aspect of the service. A computer operator or trainee is required to operate a range of computing equipment and to interpret signal patterns displayed in chart form on a graphics terminal or on plotter paper.

Applicants should have four 'O' level passes or equivalent. Previous operating experience is less important than the ability to learn and apply interpretive skills in a demanding and important task. Training in equipment operation and signal interpretation will be matched to the experience and abilities of the successful candidates.

Salary within the range £4,113-£4,888

A shift work system will be introduced, at a later date, and appropriate shift allowances paid.

Please apply, quoting reference OLI/410, to:

B. Munro, Senior Personnel Officer  
British Gas Corporation, R. & D. Division  
On Line Inspection Centre  
PO Box 3, Crumlington  
Northumberland NE23 6GQ  
Tel: Crumlington 715401 ext. 219

**BRITISH GAS**

On Line Inspection

## ICL Operators

British one of Britain's largest computer bureaux, providing a fast and efficient service to commerce and industry. Our 2900 service is expanding rapidly and as an experienced operator, you will have a major part to play in the future of the Company.

Our present 2900 department consists of a 2970 (running under VME/B) and a 2903 (running under EXEC 16), both providing vital on-line systems for major companies.

We are looking for established Operators and Senior Operators with

proven experience of VME/B, and preferably some EXEC 16 or GEORGE II - familiarity with COMMS would also be an advantage.

Salaries, for a 3 shift system, with guaranteed weekend overtime, will be negotiated, according to experience up to £7588 including shift allowance. Career development prospects are excellent. To find out more, contact Peter Storde, Sector Personnel Officer, Baric Computing Services Ltd., Forest Road, Feltham, Middx. Tel No. 01-8901414 ext. 281.

**BARIC**

An ICL/Berkeley Bank Company

## OPS FOR THE 80's

If you want to gain communications and operating systems know-how on a big scale, this installation is purpose-built!

\* It's a £1,000,000-plus purpose-built centre due for commission in 1981.

\* Hardware includes a recently-installed Univac 1100/80 to be upgraded to an 1100/81 this year and an 1100/82 (dual-processor) in 1982.

\* Plus some 76-user terminals, growing to 200 by 1983.

\* Plus a number of Univac V77 mini-computers providing a communications network for numerous highly diverse applications.

\* And micro-processor technology is already being investigated for future DP expansion.

You will provide a service to a wide variety of user departments as well as providing help and advice to other groups within the division. If you think you are

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Add to that a healthy 5-figure sum, set aside, each year for training, active encouragement of initiative, plus a vigorous policy of promotion from within and you can see there's enough here to satisfy the demands of the most ambitious operations professional.

We need both operators and operations support staff. To qualify — you are a man or woman with at least a year's experience which should include some commercial applications and mainframe operating systems.

If interested, please contact Peter Brown on 01-848 1050, Ext. 3479, or write for further details and application form to Surrey County Council, Computer Services Division, County Hall, Penrhyn Road, Kingston upon Thames.

**SURREY COUNTY COUNCIL**  
**COMPUTER SERVICES DIVISION**

## Sex Discrimination Act

No job advertisement which indicates or can reasonably be understood as indicating an intention to discriminate on grounds of sex (e.g. by inviting applications only from males or only from females) may be accepted unless:

- (1) the job is for the purpose of a private household or
- (2) it is in a business employing less than six persons or
- (3) it is otherwise excepted from the requirements of the Sex Discrimination Act.

A statement must be made at the time the advertisement is placed saying which of the exceptions in the Act is considered to apply.

## SOFTWARE ENGINEER

Pfizer Central Research is part of a leading international group engaged in the research, development, manufacture and marketing of a wide range of human medicinal and animal health products.

A Software Engineer is required to join a team of computer professionals working on a variety of database applications and software packages in a scientific environment. Together with a group of statisticians they provide a complete computing and statistical service to research division which comprises some 15 people, many of whom are qualified scientists. In-house computer facilities consist of a 11/780 and other PDP 11 computers.

Applicants, male or female, should be able to degree level in computer science or a related subject. Relevant experience particularly Fortran on PDP 11 computers, will be an advantage.

We offer competitive remuneration for flexible working hours, participation in salary continuance and pension schemes and a flourishing sports and social scene. A location within easy reach of pleasant seaside resorts, the Kentish countryside and Continental Europe.

Write or telephone for application form.  
**Mr. G. Marshall**  
Pfizer Central Research  
Ramsgate Road, Sandwich  
Kent CT13 9NJ  
Tel. (030 48) 3511

## SUPERVISOR, DP and Systems

CENTRAL LONDON

Foster Wheeler Petroleum Developments is a Company newly formed to operate in the field of offshore engineering. It is an important part of the worldwide Foster Wheeler Organisation. Its activities will include oil and gas field development, reservoir analysis, feasibility studies, consultancy services, project management, engineering and construction. As the Company expands, so exciting opportunities are created. The position is based at the Company's offices in Lower Regent Street.

The Supervisor will help establish the function and eventually control the operation of a Hewlett Packard 1000 mini-computer, other hardware and some communication facilities. He or she will also provide a consultancy and systems support service to the technical and

commercial areas of the Company. You should be educated to degree level with 5 years experience in technical and commercial systems development and support. Knowledge of mini-computers and remote bureau facilities would be a decided advantage. In addition you must be able to deal with clients and prospective clients and to sell the Company's services.

We can offer a top benefits package including relocation to the London area where appropriate. There are real opportunities for career progression in the Company and its operation expands. Written applications should be addressed to:

Paul Arney, Staff Recruitment Officer,  
Foster Wheeler, Greater London House, Hampstead Road, London NW1 7QH. Tel. 01-890 1414.



A member of the Foster Wheeler Organisation



PROGRAMMERS ANALYSTS PROJECT LEADERS CONSULTANTS

## Isn't it time you changed your job—for a career!

Survival in a career cut-throat business. The longer you leave it, the worse it gets! Working in a progressive career situation is different, it's stimulating, it's rewarding, it's a pleasure not a penance.

Individual needs can vary, but if you are 'up with the art', involved in a wide range of disciplines and applications, utilising a broad spectrum of the latest computing equipment, working in a fast growing business environment with real opportunities for personal advancement, enjoying job and company security with access to comprehensive and ongoing training — you're almost there!

Well, that's the way it is within the Professional Services Division of Control Data — and we want you to prove it for yourself. Come and meet some of our people at an —

## Open Night

in our new offices at 179/199 Shaftesbury Avenue, London W2, from 6.00 p.m. to 9.00 p.m. on Wednesday, January 23rd, 1980.

Just arrive anytime, or make an appointment if you wish. If you can't make it on that occasion, give us a call and we'll provide the information you need.

We are seeking self-motivated, creative and profit-oriented people from all levels of Commercial Applications experience in Programming, Analysis, Project Leadership and Consultancy. This could be related to either

### MAINFRAMES or MINICOMPUTERS

The jobs are based at Control Data House in

### CENTRAL LONDON

commanding starting salaries in the range

**£4,500 to £10,500**

Please contact Caroline Connaher, quoting reference GMB001, who will be pleased to supply further information.

SMR Technical Support People Ltd.

Victory House,  
99 Regent Street  
London W1R 7HB  
Telephone: 01-734 9776  
(After 6pm and weekends 01-437 8229)



MORE THAN A COMPUTER COMPANY

Peterborough Development Corporation requires a

## COMPUTER PROGRAMMER

to join a small team working on financial applications using a Honeywell 62/10.

Salary scale £5,889-£8,429 plus supplement of £10 per month pending comparability study. Starting salary will depend on experience and qualifications.

In addition the Corporation offers:  
reimbursement of removal expenses  
rented housing accommodation if required  
flexible working hours  
loans for car purchase

At least two years' experience of COBOL is essential and familiarity with Honeywell GCOS operating system would be an added advantage.

For further details ring Derek Hodge on Peterborough 68931 ext. 382, or write for an application form (returnable by 31 January 1980) to the Establishment Officer, Peterborough Development Corporation, PO Box 3, Southill Close, Peterborough PE1 1UJ.

**Peterborough**  
Cathedral city — new town

## Systems Analyst/ Programmer

SKELMERSDALE £6000 circa

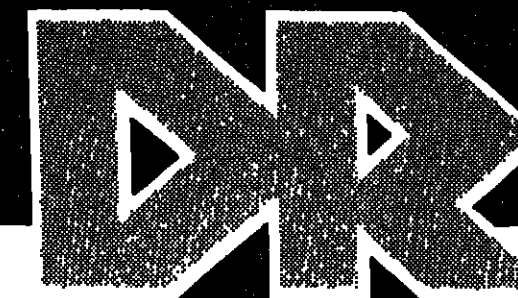
Our client is a rapidly expanding U.K. subsidiary of a major Company engaged in the marketing and distribution of domestic appliances and luxury kitchen furniture. As part of their continued development they will shortly be installing an IBM system 32.

This will provide a real opportunity for a young Analyst/Programmer to play a major part in the installation and development of computerised systems. The appointed candidate will report to the Financial Controller and work closely with Dutch and German companies. This will initially require frequent overseas visits to other group companies. Terms and conditions of employment are good and success will lead to early promotion. We would like to hear from candidates with 2/3 years programming/systems experience who are looking for a chance to be totally involved with a rapidly expanding business.

Please write or telephone for an application form to:

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Southport PR9 6PG,  
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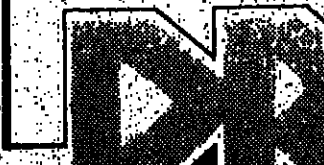
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1980

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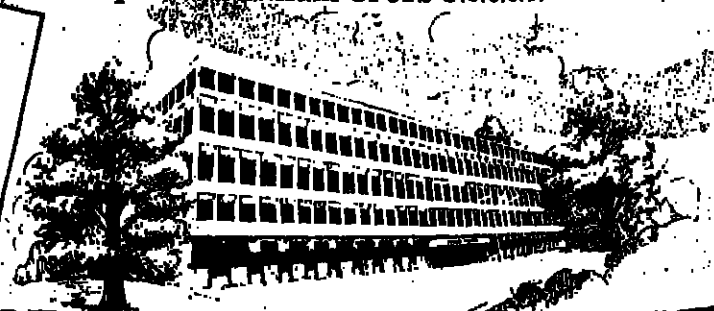
3

In return for your skills you can expect good pay and excellent working conditions to match your outstanding prospects. Analysts can expect to earn from £7,000-£10,500, and Programmers and Consultant Programmers from £6,000-£10,000 per annum.

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It all adds up to an employment package we defy you to match. And now we're into a new decade why not get it off to a great start with Tesco at Cheshunt.

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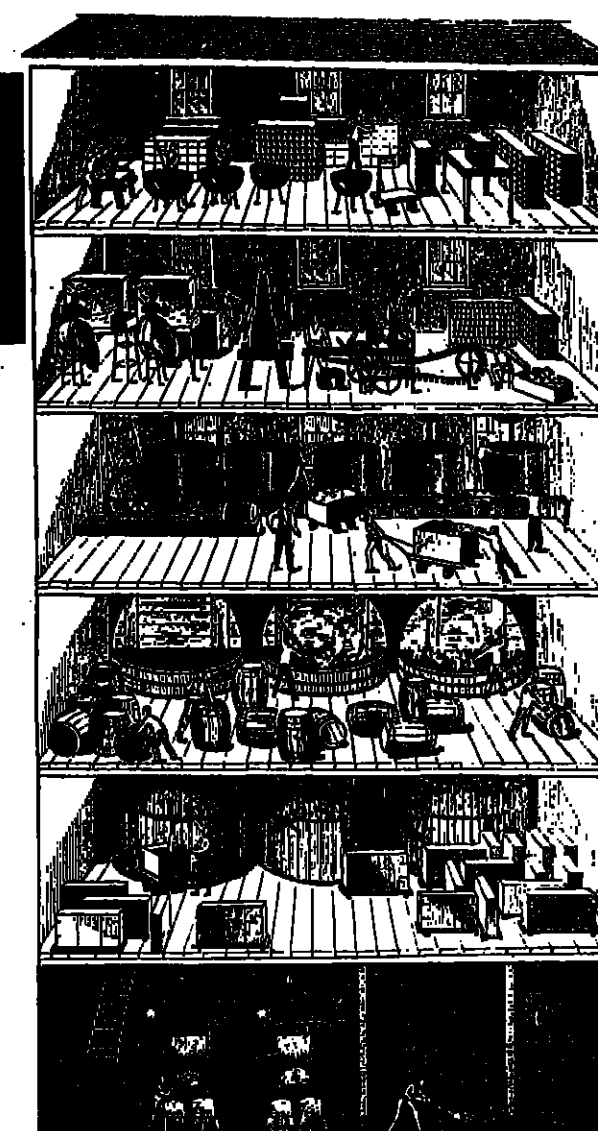
Then to arrange an immediate and confidential interview telephone, SIMON LEVER, Senior Consultant ON 021-236 3781 (24 hour answering service) OR 021-420 1574 (Evenings and weekends)

If you prefer, please write to me enclosing curriculum vitae at my Birmingham Office.



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Manchester 061-833 0427 Blackfriars House, The Parsonage, Manchester M3 2JA

Specialist Computer Recruitment Ltd



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This installation which is one of the largest collections of Control Data equipment in the world is accessed via the Boeing interactive telecommunications network and provides both interactive and batch access from the UK.

BCC is looking for engineers with experience of finite element techniques to work with its prospects and customers using the software available on the EKS system. The structural programs available include NASTRAN, MARC, GTSTRUDL, and ANSYS. In addition EKS has extensive graphics, statistical, linear programming and data base software available.

The vacancies are available in our London, Euston office. Salaries will be commensurate with experience and a company car will be provided. Applicants should have at least two years' experience of using finite element techniques. Ideally using NASTRAN. Additional training will be provided in the United States.

Telephone or write for an application form to Pauline Timberlake at Boeing Computer Centres Limited, Mainstream Division, St Martins House, 31-35 Clarendon Road, Watford WD1 1TA, Herts. Telephone Watford 38321.

### PROGRAMMERS- SOFTWARE MONITORING

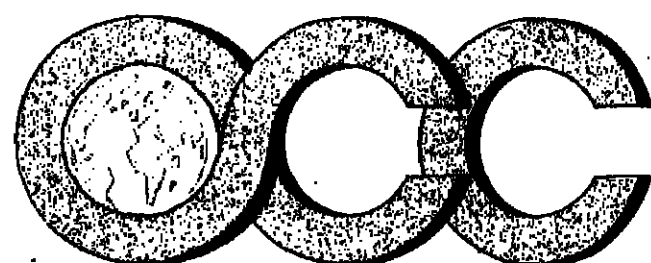
SARA—System Analysis and Resource Accounting is a software performance monitor written and marketed by Boeing with versions available for large scale IBM, Univac and Honeywell machines. SARA recreates the system load at any point in time from the SMF or similar data and then analyses this simulation to provide reports on activity levels of the hardware, tape drives, disk spindles, channels, terminal ports etc, also on the activities of programs and program steps. Output can be in the form of both tables and bar charts.

Different measures of system performance are available to understand better the workings of the machine from the financial and operational points of view.

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Vacancies exist in the areas shown below:

With experience in conducting feasibility, business and computer systems studies for database and teleprocessing applications in such areas as purchasing, materials, personnel and medical services.

With a background in IMS, database and teleprocessing applications, experience of PL1 or COBOL.

Experience in development and usage of pipeline network analysis and simulation software using FORTRAN and/or PL1 on large IBM mainframes. Responsibilities would include evaluation of existing steady-state and transient pipeline model programs, maintenance and enhancement of existing software, assisting engineering staff in analysis networks, development of models and evaluation of results, study, recommend and implement new systems.

General engineering applications systems analyst. Experience in several application areas in large IBM mainframes. Examples of pertinent software include: ICES, COGO, ROADS and STRUDL. Candidates should have a degree in engineering (or equivalent qualification) and experience in FORTRAN and/or PL1.

All candidates should have a minimum 3 years' relevant experience.

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TP Programming Applications  
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Database design and/or similar program techniques in conjunction with Database.  
CICS or RDS.

The successful candidate will work with the existing team of programmers under the general direction of the Management Services Manager. The position will be probably on a contract basis.

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The contract will be for an initial period until May, 1981.

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The salary is in the region of £2,250 per annum (including terminal grant of 25% subject to review in May, 1980). Good accommodation and car provided. Sports facilities available, six weeks' paid leave.

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Salary range:

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23387-24182

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UNIVERSAL COMPUTER ASSOCIATES LIMITED



# Bring your Analysis/ Programming experience to Honeywell and watch your career take off.

Are you seeking the challenge, stimulation and opportunities for personal development that ambitious software people need? Then you should consider Honeywell. Because, as one of the world's largest and fastest-growing computer manufacturers, we can offer your career wider scope than anything you have seen to date.

Bring us your COBOL-based Systems Analysis, Analysis/Programming or Programming experience - and we'll undertake to develop your potential to the full. Providing technical support to our Sales Executives or developing applications to meet the differing needs of Clients in the business, commercial or industrial worlds, you'll widen your experience - fast.

Our advanced, individually tailored business, technical and product training programmes will keep you constantly abreast of the latest developments. More than that, we'll actively encourage you to build on your particular strengths - making movement into Sales, Project Management or technical specialisation well within reach.

## General Systems Division

Right now we have openings for men and women in the General Systems Division which markets our Level 62 and Level 64 machines. In particular, opportunities exist within:

## Banking Group

Based in the City of London, this specialist group concentrates on the special needs of the financial and banking worlds. We are expanding our activities to take full advantage of this growing market - and are looking for systems people with some 3 to 5 years' professional experience. Since we will provide full training, there is no insistence on a financial background.

## Field Support

With vacancies in Slough, Croydon, Colchester and the City, this represents an ideal opportunity to become involved in a field support role with a world leader. Applicants should have 1 to 2 years' COBOL-based experience.

## Fortran/Management Science Specialists

We are looking for a FORTRAN-based Analyst/Programmer with a background in PERT, O & M, Financial Modelling - or one of the other management sciences. Working with our Applications Group in Slough, you can look forward to exceptional prospects.

## Tell us what you're worth!

We're expanding our operations in a big way which means we're ready to match our salaries to your talents (and potential!). Naturally, we also provide the comprehensive fringe benefits you would expect from a company at the top of the computer world. And those benefits may include a company car or car allowance, for those who need to travel widely. So get ready to move your career up to our level by completing and returning the attached coupon or telephoning Garriek Fraser on 01-568 9191 for more information.

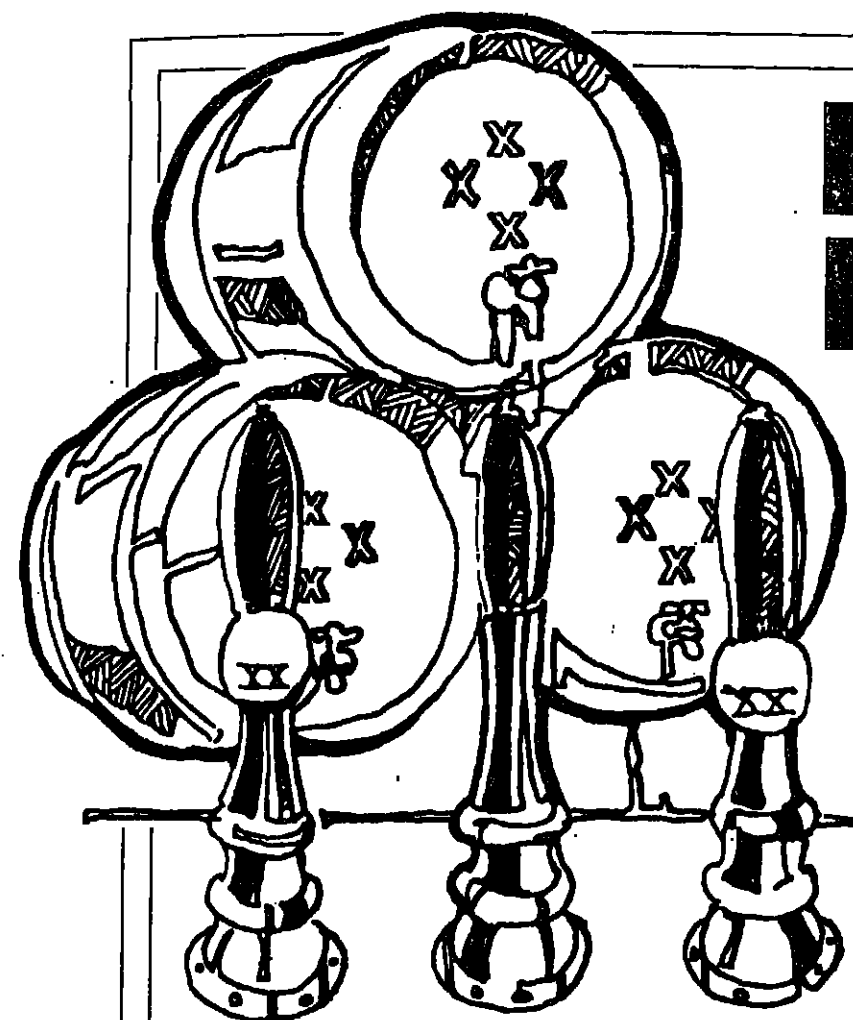
To: Garriek Fraser, Honeywell Information Systems Ltd.  
Honeywell House, Gt. West Road, Brentford, Middlesex

Name \_\_\_\_\_

Address \_\_\_\_\_

Tel. No. \_\_\_\_\_

**Honeywell**  
COMPUTER SYSTEMS



# ICL OPERATORS and DATA CONTROL CLERKS

changing to a London brewery with ICL 2960's will allow you to enjoy up to £5000 plus all the benefits!

As a result of promotions into the programming area, one of the main UK breweries have vacancies for both operators and data control clerks.

Operators, with upwards of 12 months ICL operating experience, are required to join the existing team operating our clients twin ICL 2960's. A five day week, three shift system is worked.

Two vacancies also occur for data control clerks with experience of maintaining mag tape records and the ability to control computer input/output.

The above vacancies occur at the West London computer centre where conditions of employment are very good and include an excellent subsidised restaurant together with a separate rest area offering a range of recreational facilities.

The benefits package is excellent and, as well as a start salary of up to £5000, will include generous paid overtime plus an annual drinks allowance! Interested? Then please contact SCOPE for further details.

Quote ref: CW46

**SCOPE**

SCOPE PERSONNEL SERVICES LTD  
Central House, 27 Park Street  
Croydon, CR0 1YD

01-680 5920



ICI CORPORATE LABORATORY  
RUNCORN

The ICI Corporate Laboratory, situated in Runcorn, Cheshire, has a vacancy in the Design Systems Group for a

## MATHEMATICIAN

Candidates should have a good degree in Mathematics or a related subject, and a strong interest in computing.

The work of the group involves research into Chemical Process Design techniques and covers such areas as the synthesis of processes, steady state and dynamic simulation of chemical process plants and a process engineering database.

Although prior knowledge of these areas is not essential, candidates should have experience in at least one of the following: mathematical modelling, numerical analysis, software development and support, data management.

The starting salary will be up to £6,500 and there is a profit-sharing scheme in operation.

If you are interested in this vacancy, please write enclosing full curriculum vitae to:

Miss S. E. Bird, Personnel Officer  
Imperial Chemical Industries Limited  
Corporate Laboratory  
P.O. Box 11  
The Heath, RUNCORN, Ches. WA4 4QE

## SWITZERLAND

The Bank for International Settlements  
an international institution in Basle

will have an opening as from 1st February 1980 for an

## EXPERIENCED DOS/VS OPERATOR

for its VM/370-148 computer. The right person will have 2-3 years' experience as a DOS computer operator and a good working knowledge of English.

One year contract with possibility of extension.

Please apply in writing, enclosing curriculum vitae, copies of testimonials and recent photograph to the Personnel Section, Bank for International Settlements, Postfach 282, 4002 Basle, Switzerland.

# Young Highflying Programmers

## Major System Development Programme

This is an exciting and challenging opportunity for young professionals to demonstrate their problem solving skills.

Our client is embarking on a major new development programme using DLI and CICS which includes a worldwide marketing database and an advanced on-line personnel system. The hardware is IBM and they are spending £3m on new equipment over the next two years. The Company has a small friendly and enthusiastic D.P. office in London servicing their worldwide operations of 4300 mainframes and S/34 minis.

They require Programmers particularly with at least 18 months or more experience of COBOL to play a key role on these projects. RPG II Programmers with System/34 experience are also required. This is a real chance to get in on the ground floor of this sophisticated phase of this advanced and dynamic company and make a direct contribution to its success.

Starting salaries are good, up to £8,500, non-contributory pension, travel loan, L.V.'s etc. Easy access to bus, tube and mainline stations.

We will be happy to send a short summary of our client's hardware and development projects, so please phone or write to B. Duveen for further information and an early interview, to:

DUVEEN EXECUTIVE CONSULTANTS LTD.  
55/56 St. James's Street, London SW1A 1LO  
Telephone: 01-499 2977.

## CONTRACTS

PL1	OS	KENT
2960	COBOL	BERKS
U.90/30	COBOL	DERBYSHIRE
COBOL	OS/VS	DORSET
SY. 34	RPGII	LONDON
H.62	COBOL	ESSEX
OS JCL	ROSCOE	LONDON
BURROUGHS WFL		LONDON
SY. 34	COBOL	LONDONDERRY
PDP 11	CORAL 66	KENT
BURROUGHS COBOL		YORKSHIRE
SY/PROGS	DOS/CICS/	HOLLAND
	DLI	

## TOP RATES

Datascene International Ltd.  
160-170 Regent Street  
London W1B 7LE  
Telex: 25851  
01-439 1856  
24 hour answer phone

## MACCLESFIELD BOROUGH COUNCIL BOROUGH TREASURER'S DEPARTMENT SENIOR SYSTEMS ANALYST

(2 posts)  
Salary Grade P.O. 1 (2-4) £8,447-£7,125  
The Council wishes to fill two senior posts in the Computer Section. Candidates must be proficient in Cobol programming, and have sufficient systems analysis/design experience, to exercise project control from feasibility study through to operational running.  
We offer attractive conditions of service including: in appropriate cases, 100% removal expenses and legal fees for house purchase, lodging and disturbance allowances; temporary housing may also be available.  
Application forms and job descriptions are available from Mary Farmer, Personnel Section, P.O. Box 42, Macclesfield, Cheshire SK10 1DT. Tel: Macclesfield (0625) 23556, Ext. 181.  
Closing date: February 4th, 1980.

# EXPERIENCED PROGRAMMERS

## YOUR FUTURE IS ASSURED



- Salaries to £8000 p.a. and more.
- Opportunities in manufacturing and commercial systems development.
- Advanced mainframe hardware, latest minis and communications.
- More new work, more variety and really good career prospects.

If you have read so far you know that we are advertising opportunities which will stretch and develop your career well into the 80's.

If you are a junior programmer with COBOL experience you will have the advantage of working alongside some of the best people in the d.p. industry. And you will be using up to date software and interactive program development.

For senior people there are challenging technical problems and the opportunity to develop man management skills. In fact, if you

have these skills already, you may qualify for a senior position on a scale rising to almost £11,000 p.a.

Wherever you fit in the programming ladder from 2 years experience upwards, we promise you won't waste your time if you call us. We'll tell you about the company, its track record and, more importantly, what its future growth plan can mean for your career.

Just call Mary Stone or Barry Holden. Alternatively write to:-

271 High Street,  
Berkhamsted, Herts.  
Phone: (04427) 73151



**For Quality Appointments**

**SAGITTA** In the NORTH

**NEWCASTLE AREA**

**DATABASE ADMINISTRATOR**  
EXPERIENCED DATABASE ADMINISTRATOR required by a Public Company for their new database system. The responsibilities include setting up the Database and day to day supervision. Salary will be in excess of current earnings and a good package of other benefits is offered. Relocation package available for the successful applicant to move into one of the most scenic areas of the country.

**PROGRAMMERS**  
£5 to £6,500  
IBM COBOL Programmers located in MANCHESTER. Our client offers excellent large Company benefits and conditions for Programmers with 2-5 years experience.

Circle 65,500  
City of London

Circle 67,000  
MANCHESTER based Software house requires two more COBOL Programmers with two years of more experience. IBM or HONEYWELL experience is an advantage. Excellent people relationships and many Company benefits.

Circle 66,200  
MANCHESTER BUREAU is seeking a COBOL Programmer of two to three years experience, preferably in a Bureau environment. Good contact and some post sales support work involved. The Bureau is well established with national coverage and can offer good career prospects.

**ANALYSTS**  
£4 to £6,000  
MANCHESTER IBM installation is expanding their team and needs two ANALYSTS with COBOL Programming background. The Company is internationally based and can offer excellent career prospects to the right people.

£5,000 to

£5,500 to £6,000 and car allowance  
IBM installation in GREATER MANCHESTER needs two ANALYSTS, one relatively experienced, the other very experienced, to reinforce their team. Every benefit as built a large Company.

**SALES SUPPORT**  
£5,500 to £6,500 plus car  
LEEDS/BRAEFORD, a new manufacturer requires another SUPPORT ANALYST to service the expanding number of units. Everything you would expect from a sales support role including career prospects.

**UP TO 18 MONTHS IN AMERICA**  
(AND IF YOU LIKE IT, YOU CAN STAY)  
There is a big need for experienced IBM COBOL and FORTRAN programmers in the USA. The successful candidate will receive a salary of \$18,000 to \$20,000, plus benefits. Initial 18 month contract, with the option of permanent employment if you like it in America and wish to stay. Location in New York area.

**TAX-FREE 1 YEAR CONTRACTS**  
WE NEED IBM PROGRAMMERS with OS/VS1 and Database experience in COBOL or FORTRAN, preferably with knowledge of TOTAL. VSE OFFER MINIMUM £25,000.  
FREE furnished accommodation including all utilities.  
MONTHLY pension allowance and car bonus.  
FOUR weeks paid leave with special allowances.  
FULL MEDICAL and life cover.  
FAMILY allowances and educational allowances.  
RECREATION facilities including Beach dining, tennis, golfing etc.  
LOCATION: Middle East in stable and secure Country.

**RING MACGREGOR (0823) 28888**  
Ask for Bill Simpson, SAGITTA RECRUITMENT

## SENIOR ANALYST/PROGRAMMER

GKN Distributors Fastener Division, the largest stock holder of fasteners in the United Kingdom, is seeking to expand its Computer Services team by the addition of a senior analyst/programmer.

We are firmly committed to new computer development to provide an integrated system to control our business and the senior analyst/programmer will be a key member of the small, enthusiastic team working on current systems enhancements and preparing for a new system.

This will provide the successful applicant with considerable opportunity to develop his or her responsibilities to match the growth of computerisation in our business.

If you have at least 2 years' PL1 experience we would like to hear from you. A professional qualification and/or a degree would also be an advantage, as we wish to appoint someone, who in due course, would be able to deal with all the business functions.

The position carries an attractive salary and all the benefits one would expect from employment within the GKN Group of Companies. You will be based at our attractive, modern offices at Kings Hill, Wednesbury, where we are centralising the control of our operations.

Telephone or write to Bill Hetherington, our Computer Manager at:  
**GKN DISTRIBUTORS LIMITED, FASTENER DIVISION**  
Woden Road West, Kings Hill, WEDNESBURY, West Midlands WS10 7TT.  
Tel: 021-556 1991.

**GKN** GKN-Britain's largest international engineering group

## JOHN MANSON BUTCHERS

### require an ASSISTANT IN THE COMPUTER OFFICE

The ideal applicant will be career-minded, aged between 22 and 26 years, preferably with some experience in programming in business basic.

Salary negotiable, 5-day week, subsidised canteen. Free pension and life insurance cover.

Write giving brief details of career to date to: The Personnel Director, John Manson Ltd., Manson House, 4 Lyon Road, Merton, S.W.18.

## BOX Nos.

Box number replies should be addressed to:

Box No. ....  
c/o Computer Weekly  
Dorset House  
Stamford Street  
London SE1 9LU

## NUCLEAR POWER COMPANY LTD.

### SENIOR COMPUTER OPERATOR

The Nuclear Power Company (Riley) Limited require an experienced Senior Computer Operator with a sound knowledge of IBM JCL utilities and either HASP, JES2 or JES3 operating systems. The successful person will also have working knowledge of remote networks. Daily contact with users is an important aspect of this position along with some knowledge of programming.

The Company offer the benefits of fixed working hours, four weeks annual and statutory holidays, paid sick leave and contributory pension and life assurance scheme. A generous relocation package is available to those who have to move their home.

Applicants wishing to be considered should write or telephone for an application form quoting reference No. COM WE 180/SCO  
Mr. K. A. Sykes  
Assistant Personnel Manager,  
Nuclear Power Company Limited,  
Warrington Road, RIBBLEY, Warrington, WA3 6BZ.  
Tel. Warrington (0925) 51291



## TECHNICAL MANAGER

IBM City c. £10,000 plus car

Tel. Roger Barnes on 01-628 4200

## MYRIAD

### COBOL OR ASSEMBLER

18 MONTHS MINIMUM EXPERIENCE

N.W. LONDON/HERTS BORDER £6000 - £7000

Our client is the U.K.'s leading manufacturer of specialised precision products and their modern computer centre is located in an attractive area of North London conveniently situated for all major transport networks.

As part of their total commitment to integrated Data Processing, they now wish to recruit additional Programmers and Programmer/Analysts to develop their sophisticated REAL-TIME Systems on modern Univac mainframe and mini-computers.

Successful candidates will be able to offer a minimum eighteen months' solid commercial COBOL experience and will be expected to participate fully in all areas of system design.

ASSEMBLER Programmers will be responsible for the smooth running of the current operating system and will be given both the training and opportunity to contribute in the further development of the company's own communications software.

A rewarding and challenging career is offered in a very flexible and professional working environment and is supported by a full range of company benefits.

Ref. N3/1701 CW

**MYRIAD APPOINTMENTS LIMITED**  
30 Fleet St London EC4Y 1AA Tel 01-353 0981 24 hrs

## The Polytechnic of North London

### Department of Mathematics

#### LECTURER II IN DATA PROCESSING

Candidates should have a good honours degree or postgraduate qualification which includes a substantial element of computer science, or possess an MSc by examination. They should have practical experience in the commercial Data Processing field.

The Department offers CNA BSc (Honours) courses in Mathematics and Computing, Statistics and Computing, and Mathematics and Statistics, an HND course in Mathematics, Statistics and Computing, and a range of part-time courses for a Postgraduate Diploma in Computing.

The Polytechnic has a DEC KL1091 computer system providing a general multi-access and batch processing service. The Department also has a Hewlett Packard 200E mini-computer with interactive graphics and a range of microprocessor equipment.

Salary Scale: £4770-£7148 plus a supplement of 10 per month, subject to approval, and £474 London Allowance.

Staff at the top of the Lecturer Grade II Scale can expect progression to the Senior Lecturer Scale subject to satisfying an efficiency requirement.

Application form and further details can be obtained from the Recruitment Officer, The Polytechnic of North London, Holloway Road, N7 8DB, Telephone 01-607 2766, ext. 2018.

Closing date for applications: 14 days from the appearance of this advertisement.

### COMPUTER OPERATOR

A vacancy currently exists within the Computer Operations Department for a Computer Operator. Candidates should have a minimum of one year's experience on Burroughs, ICL or IBM equipment. The installation currently works days, but is expected to start a two shift system during 1980. The position is accompanied by good promotional prospects, and the salary is negotiable.

Applications in writing, to Mrs. R. Mitchell, Personnel Department, House of Holland Limited, Chipping Warden, Nr. Banbury, Oxon. OX17 1ND.

## MVS, JES2/JES3 Support

### Systems Programmer - Holland

#### £20,000+ p.a.

We are seeking two Systems Programmers to join one of our Senior Software Consultants in the System Support Group of an MVS Data Centre in Holland. Current hardware is an 8M Amdahl/V7 and a 5M 370/188, and a major upgrade to both cpus is planned for the second quarter of 1980. Applicants should be adaptable, capable and responsible with at least three years systems programming experience, including one year or more of MVS work, preferably with TSO support duties. One of the positions will be mainly concerned with MVS support and problem determination, and the other position more involved with JES2 (JES3 later next year) including some project work on enhancing JES facilities.

For further details please telephone or write to Jim Shaw at CDS, or call him during evenings/weekends on (0980) 24546



67-73 Park Street, Camberley, Surrey GU15 3PE. Tel. 0276 25845. Telex 848698.

## SWITZERLAND

An international banking Institution has an opening for a

### DEPUTY SYSTEM SOFTWARE SUPERVISOR

In its 370/148 VM Centre

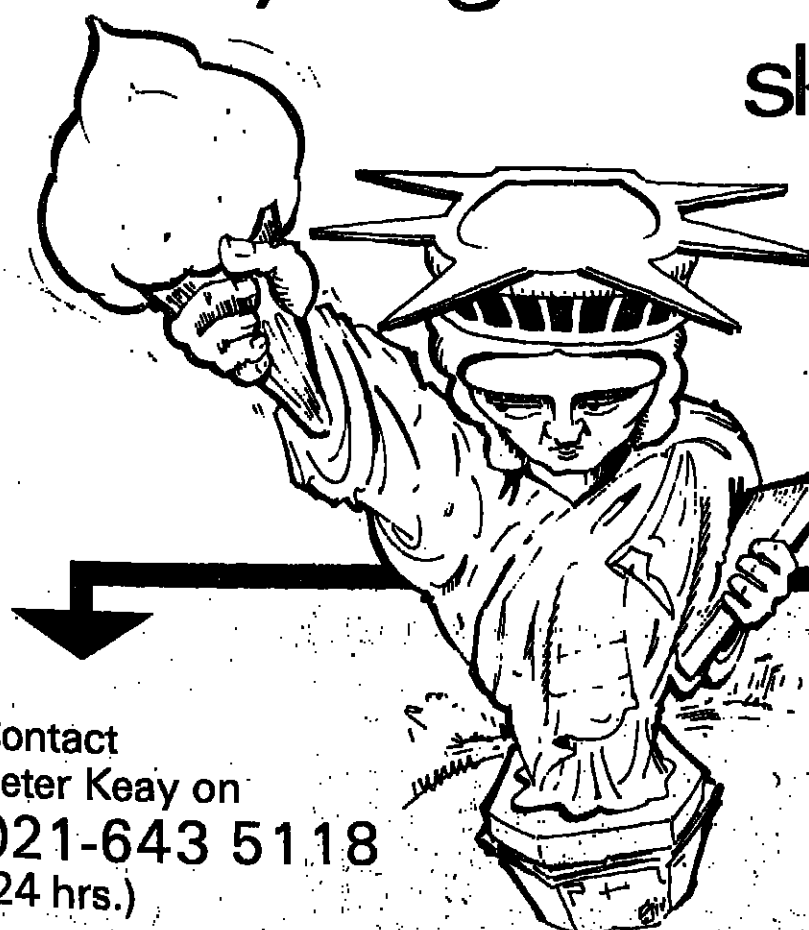
The right person will have several years' experience as a system programmer and a detailed knowledge of on-line systems. DOS/VS, POWER, VSAM, CICS and Assembler. A knowledge of VM/370 and DL/I would also be desirable.

Candidates should have English or French as mother tongue and a working knowledge of German.

Salary commensurate with experience, first-class pension and welfare schemes and other ancillary benefits. Staff restaurant; own Sports Centre.

Please apply, in writing, enclosing curriculum vitae, copies of testimonials and recent photograph to BO 470 Publicitas, Service International, CH-4010 Basle.

# Have you got the "Vanilla Flavoured" skills required by the U.S.



If you have:

1. A minimum of 2 years' experience
2. Used IBM Cobol
3. A knowledge of DOS, VS, OS or CICS
4. Any of the more exotic IBM skills.

You will get:

1. Free travel to and from the U.S.
2. A salary in the range of \$20,000 to \$35,000 depending on experience
3. Assistance with accommodation and setting up home
4. A chance to broaden your skills while meeting many of your compatriots.

**DON'T JUST THINK ABOUT working abroad—DO SOMETHING ABOUT IT!**

It is likely that these positions may be more attractive to unaccompanied males or females.

**R Project Recruitment Ltd.**

5th Floor, Scala House, Holloway Circus, Birmingham 1

A member of the Gould Computer Systems Group of Companies  
Licence No. M887  
LEO, England. Tel. 021-643 6118/9.





**If you're on form...  
...fill in this one.**

If you're performing really well in your present job, you'll be keeping your eyes open for something better.  
But being a top performer, you've got better things to do with your time than pore over pages of jobs ads and make dozens of phone calls.  
So to save time, and to get yourself lined up for some of the best jobs going, just fill in our application form.  
We'll then get back to you — fast — with details of jobs that are exactly right for you.

**Personal** Please write in ballpoint, using block capitals.  
Surname \_\_\_\_\_ Forenames \_\_\_\_\_ Mr/Ms \_\_\_\_\_  
Address \_\_\_\_\_  
Tel. Home \_\_\_\_\_ Office (discretion will be used) \_\_\_\_\_  
Age \_\_\_\_\_ Nationality \_\_\_\_\_ Car? \_\_\_\_\_  
Are you prepared to relocate in UK? ☐ Abroad? ☐ (tick box)

**Experience** Place no. of years in box, e.g. IBM 360/370 4

#### Machines:

Please specify model.

IBM 360/370 ☐

IBM others (specify) ☐

ICL 1900/2900 ☐

ICL others (specify) ☐

Honeywell ☐

Univac ☐

Burroughs ☐

PDP ☐

Other mainframes ☐

Other mini-computers ☐

(specify) ☐

**Languages**

Cobol ☐

Plan ☐

Assembler ☐

PL/1 ☐

Fortran ☐

Filelab ☐

RG11 ☐

Auto/easy/user code ☐

Others (specify) ☐

**Operating Systems**

DOS ☐

OS ☐

George (specify) ☐

CICS/HASP/GRASP ☐

DBOMP/MMT/IMS ☐

CMS ☐

Others (specify) ☐

**Position Sought**

Please state briefly the type of appointment you are seeking.

Contract? ☐ Permanent? ☐ Either? ☐ (tick box)

Minimum salary £ \_\_\_\_\_ Notice required/Date available \_\_\_\_\_

Signed \_\_\_\_\_ Date \_\_\_\_\_

Cut out the whole advertisement and post to the address below.

**Knight**

For a complete information on all the jobs available, contact us at our offices or by post to:

**Knight Computer Services Ltd.**

240, Park Road, London W14 9JL

**01-491 4706**

#### THE HATFIELD POLYTECHNIC

School of Engineering

#### Research Associate — Computer Applications

As a result of the continued expansion of research and consultancy activities a requirement has arisen for a Research Associate to work in an interesting and challenging assignment in the field of computer applications. There are two major projects of particular interest at the present time, namely:

1. The development and documentation for commercial application of scientific programmes resulting from various on-going research projects; and
2. Investigation of appropriate hardware-software interfaces which will allow groups of microprocessor based development systems access to common facilities on a multi-user basis.

The actual assignment will depend on the experience and interests of the successful applicant and registration for M Phil may be possible.

The appointment is for two years (carrying a fixed salary of £4100 per annum) and will provide valuable training for further work in associated fields.

Applications are invited from graduates holding (or expecting to obtain shortly) either a degree in computer science plus some experience of engineering programmes, or a degree in engineering or physics with a good knowledge of Fortran programming.

Application forms may be obtained from the Staffing Office, The Hatfield Polytechnic, PO Box 109, Hatfield, Herts AL10 9AB, or telephone Hatfield 65100, extension 309.

Please quote ref: 329. Closing date: 1 February, 1980.

#### Hounslow

(London Borough of)  
**EDUCATION COMMITTEE**  
Education Office, Civic Centre, Lampton Road, Hounslow, Middlesex TW3 4DN

Required for:  
**SUMMER TERM or 1 SEPTEMBER 1980**

#### PERIPATETIC ADVISORY TEACHER OF COMPUTER STUDIES

(Senior Teacher Scale)

A teacher with substantial recent experience of teaching computer studies in secondary schools is required. The person appointed should be prepared:

- (a) To advise on the choice of syllabus, its interpretation and to devise effective and efficient teaching schedules.
- (b) To co-ordinate the batch processing and computer terminal work in schools in the Borough.
- (c) To help teachers faced with technical, and other, problems in the use of these services.
- (d) To organise the in-service training of teachers who wish to teach Computer Studies.

**LONDON ALLOWANCE £327 PAYABLE**  
**CLOSING DATE: 1 FEBRUARY, 1980**  
Further particulars and application forms are available from the Director of Education, London Borough of Hounslow, Civic Centre, Lampton Road, Hounslow, Middlesex TW3 4DN, to whom they should be returned by the closing date. (Postmark stamped envelopes please.)

The Education Committee has power to consider applications from experienced teachers for assistance towards removal, disturbance or separation expenses.

**A. GROVES, Director of Education**

#### DE HAVILLAND

COLLEGE

The Campus

Welwyn Garden City

Herts.

**DEPARTMENT OF**

**COMPUTER STUDIES**

(Borehamwood site)

#### LECTURER II

Data Processing and Programming in Cobol, required as soon as possible. Commercial programming experience desirable. Duties involve lecturing, student selection, testing and interviewing, industrial consultation and liaison. Some personal consultancy work may be continued by arrangement.

#### LECTURER I

Computing. To join a lively team and teach programming and operations on full-time and adult retraining courses, all with a strong vocational bias. Both full-time and part-time applicants would be welcomed. The College computer (NCR Century 20) is an Elstron Way, Borehamwood site.

Assistance with removal expenses in approved cases.

Forms and further details from the Principal at the above address (Telephone: Welwyn Garden 28119, ext. 21).

Closing date: 28th February 1980.

Two vacancies are for

#### PROGRAMMERS

Appointments being to Computer Office in Grade III or Grade IV on a salary scale between £4,000 and £6,932 plus USS benefit. All scales are under review.

Applicants should have a degree or equivalent qualification and experience of computer use in a university environment would be an advantage. Application forms may be obtained from the Director of the University Computing Service, Computer Laboratory, Corn Exchange Street, Cambridge CB2 3RQ. Closing date: 28th February 1980.

Applications in writing to—

**Managing Director**

**MICROCOSMIC SYSTEMS LIMITED**

5/7 Telford Way

London, W3 7XZ

Closing date: 28th February 1980.

Applications in writing to—

**Managing Director**

**MICROCOSMIC SYSTEMS LIMITED**

5/7 Telford Way

London, W3 7XZ

Closing date: 28th February 1980.

#### DEVELOPMENT PROGRAMMER

With specific experience and ability with DEC LSI-11 and/or Z80 or INTEL 8080 microprocessors.

We are a small company, manufacturing a special purpose composition terminal used world wide by the printing/graphics art industry — based around a DEC LSI-11. We also produce intelligent peripherals using DEC LSI-11 and Z80 microprocessors.

This position offers scope for personal development and foreign travel (Europe and USA), combined with the satisfaction of working for a small closely knit company situated in a very pleasant area of rural England.

Please write or telephone for an application form to: Miss Lorraine Theobald, Xenotron Ltd., Vincas Road, Diss, Norfolk IP22 3HH. Telephone (0379) 461172.

#### NEW YORK → £19,000

Permanent career opportunities for all levels programming personnel (40 vacancies) located in New York.

#### SENIOR PROGRAMMERS SYSTEMS ANALYSTS PROJECT MANAGERS

So if you have:

IBM, NCR, HONEYWELL,

DEC

mainframe experience and any

PLI, BASIC, COBOL,

FORTRAN or ASSEMBLER

knowledge then our client who is interviewing

London, after the 26th January, 1980, would like

an informal talk with you to tell you about the

many benefits for single and married people in

the USA.

Phone Robert Laveland for an application form —

send your CV — NOW.

Computer Two Thousand

21-218 Tottenham Court Road

London W1P 9AT

Tel: 01-636 7584 (24 hrs)

#### TECHNICAL SALES EXECUTIVE DATA ENTRY SYSTEMS

A young vigorous and expanding company marketing micro compressor controlled data entry systems requires a technical sales Executive to promote the company's products to Computer Service Bureau Operators.

Technical sales experience and knowledge of data processing are essential and experienced data transmission systems is desirable.

Excellent remuneration package and growth with this ground-floor appointment.

Applications in writing to—

**Managing Director**

**MICROCOSMIC SYSTEMS LIMITED**

5/7 Telford Way

London, W3 7XZ

Closing date: 28th February 1980.

Applications in writing to—

**Managing Director**

**MICROCOSMIC SYSTEMS LIMITED**

5/7 Telford Way

London, W3 7XZ

Closing date: 28th February 1980.

**CHIEF OPERATOR**  
WIDEX  
We are seeking a Chief Operator for our Widex system. The successful candidate will be responsible for the operation and maintenance of the system. Experience with Widex is essential. Salary: £18,000 per annum. Applications to: Mr. J. Smith, Widex Ltd, 123 Main St, London W1A 1AA.

**OPERATIONS SUPERVISOR**  
WIDEX  
We are seeking an Operations Supervisor for our Widex system. The successful candidate will be responsible for the supervision of the operations team. Experience with Widex is essential. Salary: £16,000 per annum. Applications to: Mr. J. Smith, Widex Ltd, 123 Main St, London W1A 1AA.

**SENIOR OPERATOR**  
WIDEX  
We are seeking a Senior Operator for our Widex system. The successful candidate will be responsible for the operation and maintenance of the system. Experience with Widex is essential. Salary: £14,000 per annum. Applications to: Mr. J. Smith, Widex Ltd, 123 Main St, London W1A 1AA.

**SENIOR OPERATOR**  
WIDEX  
We are seeking a Senior Operator for our Widex system. The successful candidate will be responsible for the operation and maintenance of the system. Experience with Widex is essential. Salary: £14,000 per annum. Applications to: Mr. J. Smith, Widex Ltd, 123 Main St, London W1A 1AA.

**SHIFT LEADER**  
WIDEX  
We are seeking a Shift Leader for our Widex system. The successful candidate will be responsible for the supervision of the shift team. Experience with Widex is essential. Salary: £12,000 per annum. Applications to: Mr. J. Smith, Widex Ltd, 123 Main St, London W1A 1AA.

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**OPERATOR**  
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**How to beat  
the bush telegraph**

You can't possibly cover all the job advertisements by yourself.  
And what about all those jobs that are never advertised, because other good people hear about them first?  
You miss out.  
Break into that closed circle by enrolling with Lansdowne. We'll trump your career details onto the desks of senior managers at thousands of companies — except those you ask us not to approach.  
They'll consider you for the immediate jobs and they'll have you on file for the future.  
When they want you they'll ring you — not us — and you're immediately short listed for a job you might never have heard about.  
Just fill in the coupon and send for our Summary Form and explanatory leaflet.  
And do it at once because it's the only one that's worth thousands of applications.  
Stuart, Tel: Lansdowne Appointments Register, Design House, The Mall, London W6 6LS. Tel: 01-579 2202 (24 hour answering service)

Our clients would like to meet men and women, aged 20-40, earning between £4,000-£9,000 in any of the following categories:—  
**SYSTEMS ANALYST** ☐ **PROGRAMMER** ☐  
Mr/Ms/Ms/Ms \_\_\_\_\_  
Address \_\_\_\_\_  
Stuart, Tel: Lansdowne Appointments Register, Design House, The Mall, London W6 6LS. Tel: 01-579 2202 (24 hour answering service) CW301

**Lansdowne**

**PROGRAMMING TEAM LEADER**  
WIDEX  
We are seeking a Programming Team Leader for our Widex system. The successful candidate will be responsible for the leadership of the programming team. Experience with Widex is essential. Salary: £20,000 per annum. Applications to: Mr. J. Smith, Widex Ltd, 123 Main St, London W1A 1AA.

**SOFTWARE PROGRAMMER**  
WIDEX  
We are seeking a Software Programmer for our Widex system. The successful candidate will be responsible for the development of software. Experience with Widex is essential. Salary: £18,000 per annum. Applications to: Mr. J. Smith, Widex Ltd, 123 Main St, London W1A 1AA.

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**MID GLAMORGAN COUNTY COUNCIL**  
County Treasurer's Department

**SENIOR PROGRAMMER**

£5,220-£6,090 per annum  
(Pay Comparability Study Pending)

The Authority has taken delivery of an ICL 2972 computer and a Senior Programmer is required to join one of a number of project teams actively working on the transfer of systems to this machine.

Applicants should have a minimum of two years COBOL experience in a GEORGE 3 or VME/B environment. Commencing salary is dependent on qualifications and experience.

Benefits of working with the Authority include:

- \* Located in centre of Cardiff with easy access to shops and public transport
- \* Flexible working hours
- \* Experience of 2800 computers
- \* Contributory pension scheme
- \* Generous scheme for payment of lodging and disturbance allowances and removal expenses
- \* Subsidised canteen facilities
- \* National conditions of service

Application Forms to be returned by 4.2.80 and further particulars are obtainable from the County Treasurer, Mid Glamorgan County Council, County Hall, Cardiff.

CANVASSING WILL DISQUALIFY

**CLASSIFIED COPY**

All classified copy should reach our offices no later than 3.30 p.m. on the Monday preceding Thursday's publication.

If complete artwork is supplied, 11 a.m. on a Tuesday.

Ring Ray Kelly for further details on 01-261 8016

**Complete the coupon and return to  
Effectia Gravis at the address above,  
for your next PERMANENT or CON-  
TRACT job.** (BLOCK CAPITALS PLEASE)

Name (in full) \_\_\_\_\_

Address (Permanent) \_\_\_\_\_

Telephone: Home \_\_\_\_\_ Office \_\_\_\_\_

Type of Transport \_\_\_\_\_ Date of Birth \_\_\_\_\_

Current Position (Contract/Permanent) date \_\_\_\_\_

Salary/Rate \_\_\_\_\_

Position Required (Contract/Permanent) date \_\_\_\_\_

Salary/Rate \_\_\_\_\_

Notice Required/Date Available (delete) \_\_\_\_\_

Areas Preferred First Choice \_\_\_\_\_

Second Choice \_\_\_\_\_

Experience to date: (Last Position First) \_\_\_\_\_

Company Name From To \_\_\_\_\_

and Location Mth/Year Mth/Year Duties and experience \_\_\_\_\_

Date \_\_\_\_\_ Signature \_\_\_\_\_

Reg. No. \_\_\_\_\_ DATE \_\_\_\_\_

#### Programmers Dual 2976

COBOL PROGRAMMERS male or female with a minimum of 12 months experience are required to work on a wide range of systems, both commercial and engineering. Salary up to £7,480 per annum depending upon experience.

#### EXCELLENT OPPORTUNITIES FOR PROMOTION.

We have always been to the fore-front in computing, and intend to stay that way.

For an application form telephone 061 834 8161, Ext. 78, completed forms to be returned to The Secretary, Norweb, Chestwood Road, Manchester M8 8BA by 31st January 1980.

**norweb**

#### WOOLWORTH

#### MINI COMPUTER OPERATOR

We are looking for a mini computer operator who has held a minimum of six months experience working on a mini computer system. The successful candidate will be responsible for the operation and maintenance of the system. Experience with mini computers is essential. Salary: £10,000 per annum. Applications to: Mr. J. Smith, Woolworth Ltd, 123 Main St, London W1A 1AA.



## RECRUITMENT CONSULTANT

Earning potential in excess of £10,000 p.a. + car

Datascene is one of the most successful recruitment Consultancies operating in the DP field.

We are looking for a consultant to join our highly successful team thus expanding our service to clients even further.

You will work closely with clients on all aspects of recruitment from job identification, giving advice on advertising, writing copy, interviewing and personnel selection.

You should be 22+ professional in approach and have a proven track record in DP. You will ideally be used to dealing directly with clients at all levels up to Senior Management.

This coupled with sound business sense and capacity for hard work should put you in the £10,000 + bracket within 1 year.

We offer an attractive salary package plus a company car after 6 months.

Please contact Mike Dauncey to arrange an interview on either of the above appointments on 01-439 1856

Datascene Recruitment Ltd  
Septre House  
169-173 Regent Street  
London W1R 7FB

datascene

01-439 7871  
24 hour answer phone

## REAL-TIME PROGRAMMERS

£ DEPENDENT ON LOCATION

UK & OVERSEAS

Take advantage of our position as one of the leading recruitment specialists in the field of scientific programming. Today, more than ever, there is a demand for highly-skilled personnel with the ability to tackle wide ranging projects in the design and development of scientific computer systems. If you hold a degree in a scientific discipline or have relevant practical experience of real-time mini computer systems, using either ASSEMBLER, BASIC+, MACRO II, CORAL or FORTRAN, then give Mike Howard a ring on the above number.

## HOLLAND, GERMANY, BRUSSELS, IRELAND SWITZERLAND

Based in convenient locations throughout Europe are a choice group of Blue Chip companies requiring expertise in any of the following or associated areas.

REAL-TIME COMPUTER SYSTEMS — COMMUNICATIONS  
SCIENTIFIC/TECHNICAL — BASIC SOFTWARE DEVELOPMENT  
COMMERCIAL BUSINESS SYSTEMS

For further details please contact Eddie Howard.

**Edmund Howard & Partners**

8 BRIGHTON ROAD, SURREY, ENGLAND. TEL: 01-399 9183

Computer Personnel Consultants

## CONTRACT SALES CONSULTANT

Earning potential in excess of £16,000 p.a. + car

We are looking for a person with a DP background who has the ability to succeed in a sales environment to join our team of consultants. Ideally you are working in a client contract situation at present.

The contract market is hard and highly competitive. You will need to be resilient, resourceful and extremely self-motivated. In return we will offer you relevant training and support, an attractive salary package, plus a company car and an opportunity to develop your own area within our fast expanding organisation.

You will have your own area to find job requirements and negotiate contracts with clients.

## Computer Systems Salesmen

£9,000-£12,500 + car

NORTH-EAST AND SOUTH-WEST ENGLAND

Hewlett Packard is a large successful International Electronics and Computer Company employing over 50,000 people worldwide.

Our Computer Systems Group currently need to recruit salesmen for the North-East of England to sell Desk Top and Technical computer systems into the manufacturing industry.

We also require salesmen in the South-West based at our Winners offices to sell our range of commercial computer systems.

Applicants aged 23-35 should have a degree or equivalent qualifications in Computer Science or related technical discipline and ideally relevant sales experience. We will consider those who do not have sales experience but who have a thorough knowledge of the computer industry.

Besides a salary between £9,000 and £12,500 including commission we offer an excellent benefits package including:

- \* Twice-yearly cash profit sharing
- \* Christmas Bonus
- \* Non-contributory pension scheme
- \* Free life assurance
- \* Share purchase scheme

If you are interested in working for a fast-moving and growth-oriented company with good future prospects please phone or write, giving career details, to:

Christine Bristow, Personnel Department, Hewlett Packard Limited, King Street Lane, Winkersley, Wokingham, Berkshire. Telephone: Wokingham 784774, Extension 2127.

These positions are open to men and women.



**HEWLETT  
PACKARD**

## COMPUTER OPERATIONS

Up to £5590

In a year that promises to be another record for Volvo in the U.K., we are looking for Computer Operations Staff to join us within our Head Office at High Wycombe. Our new computer installation consists of twin ICL 2950's which you would be responsible for running, together with associated terminals and micro computers. We operate on a 5 day, 3 shift basis. To join us you should have had previous mainframe experience, preferably with ICL 2950, 2903/4

or 1900 operating under George II. We're offering salaries ranging from £6050 for an Operator to £5590 for a Shift Leader, and a first-class range of benefits, including 22 days holiday, non-contributory pension, sickness and personal accident schemes and car purchase scheme. Please telephone for an application form, or alternatively apply in writing giving full details to:

Mr. M. Rogers,  
Divisional Personnel Manager,  
Volvo Concessions Limited,  
Lancaster Road,  
Cressex Industrial Estate,  
High Wycombe, Bucks.  
Tel: (0494) 33444.



**VOLVO**



## Office Automation

Our international consultancy firm is expanding its role of advising clients on office automation. Success in this role requires more than the right technical solution. It also needs the ability to gain the confidence of client staff and to motivate and work with them to achieve the desired change.

If you are interested in the management of change and have the ability to motivate staff during major re-organisations of work methods, then we can offer you challenging opportunities. We are seeking men and women aged 25-35 with the right blend of personal skills and a high level of technical expertise in several of the following areas:

- \* small office computers
- \* word processing
- \* computer communications
- \* clerical work studies
- \* facsimile and other communications media
- \* computer mail
- \* data capture technology

Consultancy offers the opportunity to tackle interesting human and technical problems in a varied range of environments, from major international organisations to small specialised business operations. If you would like to discuss a possible career with us, please telephone Ernest Morris or Bruce Thomson on 01-806 4040, or write giving brief but comprehensive details of career and salary to date quoting Ref. SW30/10 to the Executive Selection Division at the address below.

**Coopers & Lybrand Associates Limited,**  
Management Consultants  
Shelley House, Noble Street, London EC2V 1DO.

## SMR Sales & Marketing Recruiters Ltd

We would like to wish a  
**HAPPY NEW YEAR**

to all the  
**SALESMEN**

who secured new jobs, achieved enhanced status, and received career guidance with the help of our organisation in 1979.

We also extend our best wishes for the coming year to all our clients throughout the computer industry and assure them of our continuing support in their search for EXPERIENCED and TRAINEE SALES PEOPLE and PRE-POST SALES PERSONNEL.

For those clients who have yet to use our RECRUITMENT services, or indeed our facilities for SALES TRAINING, SALES ANALYSIS, ASSESSMENT and MARKET RESEARCH, we hope 1980 will be the year in which we do business together.

TRADER and the TEAM

Tel: 01-734 9776

A Sales and Marketing Services Company

TRAINING PROMOTION RESEARCH RECRUITMENT

## ELECTRONIC ENGINEERING OPPORTUNITIES IN TELECOMMUNICATIONS

Location Huyton

Plessey is a major supplier of electronic telephone exchanges to the Post Office. The Huyton Engineering Unit undertakes many activities including the support of TXE4, which uses distributed processor control and provides a modular flexible system for director and non-director local exchanges of up to 40,000 lines.

Headquarters engineering and manufacture of TXE4 are in a modern plant at Huyton, near Liverpool, adjacent to the M62 motorway with another manufacturing plant at Chorley in Lancashire.

We are looking for qualified Electronics Engineers at all levels to join engineering teams engaged on a wide range of activities concerned with the rapid growth in electronic switching and introduction of enhanced equipment.

In particular, we would like to hear from people interested in:

## SYSTEMS AND CIRCUITS ENGINEERING TEST SYSTEMS SOFTWARE ENGINEERING

For further details of these vacancies and an application form, please telephone the following number between 10 a.m. and 7 p.m. on Friday, 18th, Monday 21st or Tuesday, 22nd January - 051-480 8200, or write with details of your career, experience and qualifications to:

The Personnel Officer  
Plessey Telecommunications Limited  
Wilson Road  
Huyton, Merseyside

**PLESSEY**

## AIR NIUGINI

Papua New Guinea's National Airline

requires

## SENIOR ANALYST/PROGRAMMER

LOCATION: Port Moresby — PNG Capital.

SALARY RANGE: K16700/18000 p.a., which equates to £8g. 10895/11530.

APPLICANTS: Should have designed and implemented at least one major system, be familiar with ICL utilities and have at least 3 years' COBOL programming. It is preferred that the applicant has tertiary qualifications and a knowledge of on-line systems.

EQUIPMENT:  
ICL 2950/10 1 MB under DME  
ICL 2903 48K  
TP MONITOR: Telecomputing's TFS.

Attractive conditions include annual return flights, free accommodation, airline concessions, assistance with removal and repatriation, liberal sick and recreation leave, medical scheme and payment of school fees within Papua New Guinea and assistance with education overseas.

Applications detailing personal and work history will be treated in confidence and should be addressed to the:

Personnel Manager  
AIR NIUGINI  
c/o 84 London Road  
Cambridge, Surrey, England

## THE SALES BIT

# A picture is worth 1,000 words

A WELL-ESTABLISHED saying tells us that "a picture is worth 1,000 words". In reality the truth of that statement must be a function of the particular picture or set of words.

This column usually consists of about 900 words, which may give you some measure of the literary scope of the adage.

However, it is a well-established fact that people generally remember in greater detail — and for longer periods — things they have only seen as opposed to only heard.

For instance, people typically remember faces and forget names, as opposed to the contrary.

Clearly, information which is received by way of both sight and sound must have a compounding benefit, as one has the effect of stimulating the other.

Compare, for instance, the accuracy of routing instructions for driving to an out-of-the-way spot which are received over the telephone with a drawing or map received through the post. The visual description is almost certain to be more meaningful.

Yet compare both with the interactive process of having the route explained by someone with the aid of a map. The latter process must always put over the necessary information more accurately and memorably.

This is undoubtedly true of the selling process. The benefits of using visual aids to emphasise and clarify the sales message are considerable.

Sales literature usually comes under the heading of visual aids; but to be effective it has to be specifically designed to augment the sales story and it has to be used properly.

Many brochures, leaflets and catalogues tend to take the form of technical specifications and related company and product information which, by and large, has greatest value after the sales call rather than during it.

If pictures are to emphasise or clarify, they must be compatible with statements such as "This is what the product looks like". This is the kind of information the system produces.

"This graph shows the relationship between output and consumption". This is how one of our existing clients uses the product.

"This is a picture of my sales manager's mistress", and so on.

Flip charts are a useful form of visual aid, particularly when it comes to emphasising key words and statements or displaying the relationships between figures.

One should not limit their potential to those metallic easels, well beloved of all sales meetings, which often need an IQ of 180 plus to get them up, yet can be relied upon to collapse immediately prior to the climax of the presentation.

The use of desk-top flip charts of around A3 size

often makes much more sense when dealing with very small numbers of people.

However, one factor is imperative: the data must be presented in a professional manner. Nothing reduces the impact of information more than scruffy presentation.

You don't have to be an artist, but if you can't produce neat lettering with a felt-tip, get someone else who can.

For a really key presentation, why not employ the services of a commercial artist? That can do a lot for your professional image.

One useful tip for remembering important points within a flip chart presentation: Write them in pencil in the appropriate place with sufficient intensity to be seen by the presenter but not the audience.

I have always maintained and employed a "flogging book" as a permanent source of visual aids to assist in the selling process.

The purpose is to collect items to which one can quickly refer in order to emphasise a sales point.

These include written extracts and pictures from the Press and brochures, tables of information, sample input formats and output documents, pictures of products and accessories, pictures of reference clients, price lists and sample advertisements.

I am convinced that no salesman should be without one — but be sure to keep it up to date.

The use of films and photographic slides can also be effective in exploiting the power of sight and sound. One primary advantage is the ability to demand temporarily the total attention of the client.

"Switch off the light and take the phone off the hook, we're going to have a picture show!"

However, like any other selling aid, done well they are a boon; done badly, they can be a disaster. Here are some basic rules:

1. Check that all the equipment has been received and works well before the event.

2. Make sure the film you received is the one you requested — or even the correct one!

3. Make sure the cables are long enough to reach from the socket to the point of presentation and that the plugs fit!

4. Thoroughly practise the presentation in its entirety as close to the event as practical — but not too close.

5. Count the number of people in the room before you switch off the lights. You wouldn't want to lose any, would you?

TRADER

**Puzzle Answer**

1. 15

2. 322

3. 222

4. 222



## "GROUND FLOOR" OPPORTUNITY-HAMMERSMITH

Start the New Year with a brand new installation.

IBM 4331 running under DOS/VSE and VSE/POWER utilising CICS/VS and DL1, to be delivered within the next two weeks.

We therefore URGENTLY require the following people:

**PROGRAMMER/ANALYST**  
£6,000-£7,000

To be involved in the development and programming of numerous commercial applications

**OPERATIONS SUPERVISOR**  
£5,500-£6,500

To operate and control the operations of the new hardware, and existing bureau work.

Requirements for both of the above:

- 4 years' relevant experience.
- Knowledge of DOS/VS JCL and Catalogues procedures.

- Exposure to CICS/VS and DL1 desirable.
- Experience of IBM Program Development Methodology for the Programmer/Analyst position, and Supervisory experience for the Operations position would also be advantageous.

Other benefits for both these positions include:  
45p per day LVs.  
Flexible working hours  
Free Life Assurance and Contracted-out Contributory Pension Fund.  
Annual season ticket loans for one year's service

## Linguaphone

Application forms and job descriptions may be obtained from

Personnel Department, Linguaphone Institute Limited,  
Linguaphone House, Beaver Lane, Hammersmith,  
London W6 9AR  
Tel: 01-741 1655, ext. 262

## NALGO

As a result of internal re-organisation and promotions, we require the following staff:

**(1) OPERATIONS MANAGER**  
- £7386 to £8061 p.a. incl.

Applicants should have a thorough knowledge of J.C.L. (or GII) and an appreciation of Data Control Techniques. The post could suit a Shift Leader seeking a first experience of management.

**(2) PROGRAMMERS - £6840 to £7752 p.a. incl.**

Minimum of 1 1/2-2 years' experience of ICL COBOL.

The Association has a 48K ICL 2904 (to be upgraded to 64K) with EDS 80s Mag. Tapes and DDE input. A review of all current systems (which include Financial, Insurance and Building Society applications) has identified the need for major re-systemisation. Future developments will include a communications system.

**BENEFITS INCLUDE:** 17 1/2% rebate on mortgage interest; 26 days' annual leave; 13 days' public holiday; interest-free season-ticket loans; subsidised staff restaurant and modern working environment; active sports and social club; removal and disturbance allowances.

Further information ring: Alan Cawdell (x 364) or John Faithfull (x 380) on 01-388 2366 or write for application forms and details to: The General Secretary, National and Local Government Officers' Association, 1 Mableton Place, London WC1H 9AJ.

Closing date for receipt of applications is January 31, 1980.

## PRODUCT MANAGER FOR ARRAY PROCESSOR

Analogic Limited is looking for a Product Manager to handle its new AP400 Array Processor which is finding wide applications in medical imaging, including computer assisted tomography systems, seismic research and energy exploration, satellite communications, etc.

The right candidate for this position will be qualified to at least honours degree, and preferably PhD standard, with experience in computer hardware of most of the leading micro and mini computer manufacturers, and at the same time be an expert in software applications.

The job will consist of marketing and promotion of the Array Processor in the U.K. and giving full technical support to the distributors and subsidiaries throughout Europe, working in conjunction with the International Sales Manager.

The position carries a salary of £16,000 p.a., plus a 2-litre company car, four weeks' holiday, pension scheme, full travelling expenses, etc.

Write or telephone for an interview to:

L. E. Mason, General Manager  
ANALOGIC LIMITED  
The Centre, 68 High Street, Weybridge, Surrey KT13 8BN  
Tel: Weybridge 41215

## EUROCOM COM-GROW WITH US

EUROCOM is UK BASED and the LARGEST LEADING C.O.M. (Computer Output to Micro-film) Service Company operating 18 BUREAUX IN EUROPE, 9 IN THE UK plus a further 9 in Sweden, Germany, Denmark and Finland.

The Use of COM TECHNOLOGY IS INCREASING AT 30% P.A. As a market leader EUROCOM'S 40% growth in recent years is forecast to continue well into the 80's.

All posts carry excellent banking fringe benefits. To continue this growth rate we require:

**SALES EXECUTIVES**  
LONDON, LEEDS, BIRMINGHAM  
CARDIFF, RICKMANSWORTH

Experienced Bureau sales staff can expect to earn £8-10,000 (high basic + commission) + car marketing COM and microfiche viewing equipment.

ALSO we would be pleased to hear from Systems personnel from computer or business background who wish to move into selling, or business equipment sales staff anxious to keep pace with advancing technology.

**SALES SUPPORT SYSTEMS STAFF**  
LONDON, LEEDS, RICKMANSWORTH

Programmers/Analysts with at least 1-2 years' mainframe experience are required to support growth and involvement with all types of computer systems especially the use of COM in conjunction with real time systems. Salary on a scale rising to £6,500 with excellent growth potential.

Please write or telephone to:

Ian Woolcott  
EUROCOM DATA LIMITED  
3 High Street, Rickmansworth, Herts.  
Tel: Rickmansworth 74323

**Eurocom Data Limited**  
A member of the National Westminster Bank Group

HERTFORDSHIRE COUNTY COUNCIL  
HIGHWAYS DEPARTMENT

## SENIOR ANALYST

SALARY £6627-£7908 + £189 FRINGE

WEIGHTING (presently under review)

GRADE PO1 (E/F) POST NO. SE46

### The Job

We offer you the opportunity to join the Highways Computer Unit where you will be able to develop and support a wide variety of engineering and management information systems.

You will be responsible for the control of development projects from feasibility through to implementation with the assistance of a small team whose work you will plan and direct.

Existing applications for which the team is responsible are Road and Bridge Design, PERT and Staff Costing, Street Lighting Inventory and Financial Control and Transportation Modelling.

The present County Council computer is an NCR Criterion 8580 with 1 Megabyte of Memory operating under VRX. Access from Highways department is via Courier Service and a single terminal. The department also make considerable use of computer bureaux via a remote batch terminal and a number of interactive terminals.

In June, 1980, the Highways department is to take delivery of a PRIME 350 mini computer which will be linked to the County Council Computer and a computer bureau add which will service a network of terminals within the site at Goldings, performing a wide range of activities, also connected to the PRIME will be a new online drum plotter.

New projects for the team include the development of a new PERT system including Target Design Costing and new Transportation Modelling facilities as well as providing technical support for the department's impending use of MOSS.

### The Person

You should have a degree in Civil Engineering, Applied Mathematics or Computing and extensive experience in technical computing with a background in COBOL and FORTRAN programming.

Please telephone or write for application forms and further details to Deborah Martindale, Highways Department, Goldings, North Road, Hertford SG14 2PY. Telephone Hertford 64242 Extension 8020

Closing date February 8, 1980.

## COMPUTER SYSTEMS SPECIALIST

Worley Engineering, one of the largest employers in Wood Green, require a Computer Systems Specialist for their new air conditioned offices opposite Wood Green underground.

Applicants should be competent computer programmers or experienced EDP clerks who would like to learn higher level computer application languages. Work will involve engineering application program maintenance and use. Knowledge of Fortran and/or time share systems would be useful but not essential.

Good negotiable salary and benefits. For further details please contact Rose Gunson, Personnel Assistant.

**WORLEY**

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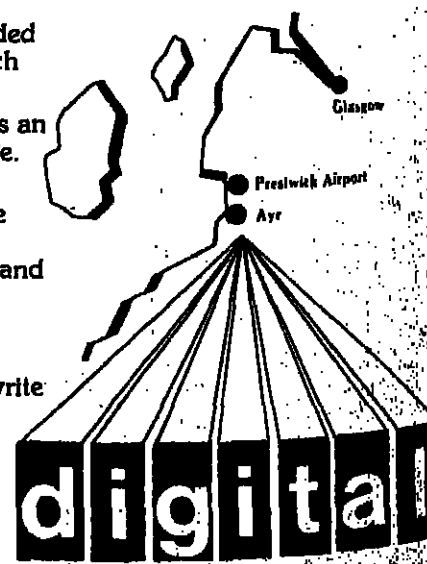
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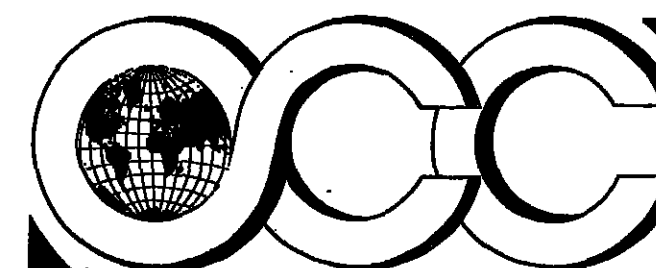
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Tel: Ayr 66955.



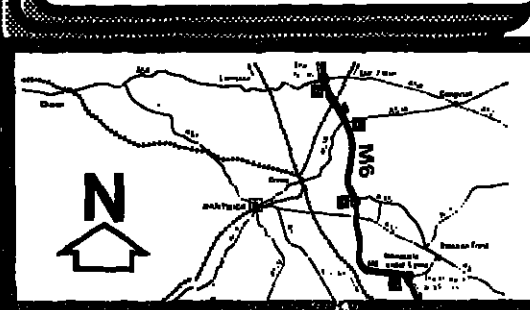
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## COMMERCIAL ANALYST

We have vacancies in our head office in Cardiff for two experienced Commercial Analysts to assist in the development and implementation of local and Group-based systems. The Company will shortly be installing a Univac V Series computer linked to a Univac 1110 mainframe.

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